



STATE OF UTAH - DEPARTMENT OF ADMINISTRATIVE SERVICES

DFCM

Division of Facilities Construction and Management

**MULTI-STEP BIDDING PROCESS
FOR
CONTRACTORS**

**Request For Solicitation For
Construction Services**

Stage II – Roofing Contractors Bidders List FY08

June 8, 2007

**ROOFING IMPROVEMENTS
CENTER FOR PERSONS WITH
DISABILITIES**

**UTAH STATE UNIVERSITY
LOGAN, UTAH**

DFCM Project No. 07017770

Tracy Stocking & Associates
17 Exchange Place
Salt Lake City, Utah 84111

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Current copies of the following documents are hereby made part of these contract documents by reference. These documents are available on the DFCM web site at <http://dfcm.utah.gov> or are available upon request from DFCM:

DFCM General Conditions dated May 25, 2005

DFCM Application and Certificate for Payment dated May 25, 2005

Technical Specifications:

Drawings:

The Agreement and General Conditions dated May 25, 2005 have been updated from versions that were formally adopted and in use prior to this date. The changes made to the General Conditions are identified in a document entitled Revisions to General Conditions that is available on DFCM's web site at <http://dfcm.utah.gov>

INVITATION TO BID

ONLY FIRMS PRE-QUALIFIED DURING STAGE I OF THE RFS ARE ALLOWED TO BID ON THIS PROJECT

The State of Utah - Division of Facilities Construction and Management (DFCM) is requesting bids for the construction of the following project:

ROOFING IMPROVEMENTS - CENTER FOR PERSONS WITH DISABILITIES
UTAH STATE UNIVERSITY – LOGAN, UTAH
DFCM PROJECT NO: 07017770

Project Description: Remove existing built up roof system and replace with new mechanically attached PVC roof system. Construction Cost Estimate: \$240,000

Company	Contact	Fax
Advanced Systems Construction	Brent Larsen	(801) 763-0108
All Weather Waterproofing, Inc	Delmar Johnson	(801) 467-3961
Capitol Roofing Service	Stewart B. Paulsen	(801) 562-1159
Clark Quality Roofing	Perry Clark	(801) 266-3692
Collins Roofing, Inc.	Douglas Collins	(801) 224-0361
Contract West Roofing, Inc.	Craig Peters	(801) 943-0257
Conwest, Inc.	Phil Scarborough	(815) 550-1136
Dave Atkinson Roofing, Inc	Dave Atkinson	(435) 258-2225
Heritage Roofing, LC	James Smith	(801) 576-8311
Island Heights Construction, Inc.	Terry Cronquist	(435) 753-7452
Kendrick Brothers Roofing, Inc.	Brad L. Kendrick	(801) 731-2020
Nielco Roofing and Sheet Metal, Inc.	Gary Nielson	(801) 263-0485
Redd Roofing Company	Frank Redd	(801) 621-1540
Utah Tile and Roofing, Inc.	Paul Seppi	(801) 266-6836
Utah Western Roofing	Scott Laufenberg	(801) 294-6155

The bid documents will be available at 10:00 AM on Friday, June 8, 2007, and distributed in electronic format only on CDs from DFCM at the Wasatch Building at the Utah State Fairpark, approximately 155 North 1000 West, Salt Lake City, Utah and on the DFCM web page at <http://dfcm.utah.gov>. For questions regarding this project, please contact Darrell Hunting, Project Manager, DFCM, at (801) 538-9617. No others are to be contacted regarding this project. A **MANDATORY** pre-bid meeting and site visit will be held at 2:00 PM on Wednesday, June 13, 2007 at Utah State University in Logan, Utah. Meet on the north side of the CPD Building (see map on sheet G101). All pre-qualified prime contractors wishing to bid on this project must attend this meeting.

Bids must be submitted by 1:45 PM on Wednesday, June 20, 2007 at the Wasatch Building at the Utah State Fairpark, approximately 155 North 1000 West, Salt Lake City, Utah. Refer to the map on the DFCM website for directions (http://dfcm.utah.gov/downloads/fairpark_map.pdf). Bids will be opened and read aloud in the Wasatch Building at the Utah State Fairpark. Note: Bids must be received at the Wasatch Building at the Utah State Fairpark by the specified time. The contractor shall comply with and require all of its subcontractors to comply with the license laws as required by the State of Utah.

A bid bond in the amount of five percent (5%) of the bid amount, made payable to the Division of Facilities Construction and Management on DFCM's bid bond form, shall accompany the bid. The Division of Facilities Construction & Management reserves the right to reject any or all bids or to waive any formality or technicality in any bid in the interest of the State.

DIVISION OF FACILITIES CONSTRUCTION AND MANAGEMENT
MARLA WORKMAN, CONTRACT COORDINATOR
4110 State Office Bldg., Salt Lake City, Utah 84114

STAGE II - MULTI-STEP BIDDING PROCESS

ONLY FIRMS PRE-QUALIFIED DURING STAGE I OF THE RFS ARE ALLOWED TO BID ON THIS PROJECT

1. Invitational Bid Procedures

The following is an overview of the invitational bid process. More detailed information is contained throughout the document. Contractors are responsible for reading and complying with all information contained in this document.

Notification: DFCM will notify each registered pre-qualified firm (via fax or e-mail) when a project is ready for Construction Services and invite them to bid on the project.

Description of Work: A description of work or plans/specifications will be given to each contractor. If required, the plans and specifications will be available on the DFCM web page at <http://dfcm.utah.gov> and on CDs from DFCM at the Wasatch Building at the Utah State Fairpark, approximately 155 North 1000 West, Salt Lake City, Utah.

Schedule: The Stage II Schedule shows critical dates including the mandatory pre-bid site meeting (if required), the question and answer period, the bid submittal deadline, the subcontractor list submittal deadline, etc. Contractors are responsible for meeting all deadlines shown on the schedule.

Mandatory Pre-Bid Site Meeting: If a firm fails to attend a pre-bid site meeting labeled “Mandatory” they will not be allowed to bid on the project. At the mandatory meeting, contractors may have an opportunity to inspect the site, receive additional instructions and ask questions about project. The schedule contains information on the date, time, and place of the mandatory pre-bid site meeting.

Written Questions: All questions must be in writing and directed to DFCM’s project manager assigned to this project. No others are to be contacted regarding this project. The schedule contains information on the deadline for submitting questions.

Addendum: All clarifications from DFCM will be in writing and issued as an addendum to the RFS. Addenda will be posted on DFCM’s web site at <http://dfcm.utah.gov>. Contractors are responsible for obtaining information contained in each addendum from the web site. Addenda issued prior to the submittal deadline shall become part of the bidding process and must be acknowledged on the bid form. Failure to acknowledge addenda may result in disqualification from bidding.

Submitting Bids: Bids must be submitted to DFCM by the deadline indicated on the schedule. Due to the ongoing construction on Capitol Hill and the anticipated shortage of parking during 2007, all bids will be received at the Wasatch Building at the Utah State Fairpark. Refer to map on the DFCM web site for directions (http://dfcm.utah.gov/downloads/fairpark_map.pdf) Bids submitted after the deadline will not be accepted. Bids will be opened by DFCM on the date, time, and place indicated on the schedule.

Subcontractors List: The firm selected for the project must submit a list of all subcontractors by the deadline indicated on the schedule contained in this document.

Pre-qualified List of Contractors: Contractors shall remain on DFCM’s list of pre-qualified contractors provided: (a) they maintain a performance rating of 4 or greater on each project, (b) they are not suspended for failure to comply with requirements of their contract, (c) the firm has not undergone a significant reorganization involving the loss of key personnel (site superintendents, project managers, owners, etc.) to a degree such that the firm no longer meets the pre-qualification requirements outlined in Stage I, (d) the financial viability of the firm has not significantly changed, and (e) the firm is not otherwise disqualified by DFCM. Note: If a contractor fails to comply with items (a) through (e) above,

they may be removed from DFCM's list of pre-qualified contractors following an evaluation by a review committee. Contractors will be given the opportunity to address the review committee before a decision is made. Pre-qualified contractors are ONLY authorized to bid on projects within the discipline that they were originally pre-qualified under.

2. Drawings and Specifications and Interpretations

Drawings, specifications and other contract documents may be obtained as stated in the Invitation to Bid. If any firm is in doubt as to the meaning or interpretation of any part of the drawings, specifications, scope of work or contract documents, they shall submit, in writing, a request for interpretation to the authorized DFCM representative by the deadline identified in the schedule. Answers to questions and interpretations will be made via addenda issued by DFCM. Neither DFCM or the designer shall be responsible for incorrect information obtained by contractors from sources other than the official drawings/specifications and addenda issued by DFCM.

3. Product Approvals

Where reference is made to one or more proprietary products in the contract documents, but restrictive descriptive materials of one or more manufacturer(s) is referred to in the contract documents, the products of other manufacturers will be accepted, provided they equal or exceed the standards set forth in the drawings and specifications and are compatible with the intent and purpose of the design, subject to the written approval of the Designer. Such written approval must occur prior to the deadline established for the last scheduled addendum to be issued. The Designer's written approval will be included as part of the addendum issued by DFCM. If the descriptive material is not restrictive, the products of other manufacturers specified will be accepted without prior approval provided they are compatible with the intent and purpose of the design as determined by the Designer.

4. Addenda

All clarifications from DFCM will be in writing and issued as an addendum to the RFS. Addenda will be posted on DFCM's web site at <http://dfcm.utah.gov>. Contractors are responsible for obtaining information contained in each addendum from the web site. Addenda issued prior to the submittal deadline shall become part of the bidding process and must be acknowledged on the bid form. Failure to acknowledge addenda shall result in disqualification from bidding. DFCM shall not be responsible for incorrect information obtained by contractors from sources other than official addenda issued by DFCM.

5. Financial Responsibility of Contractors, Subcontractors and Sub-subcontractors

Contractors shall respond promptly to any inquiry in writing by DFCM to any concern of financial responsibility of the Contractor, Subcontractor or Sub-subcontractor. Failure to respond may result in suspension from DFCM's list of pre-qualified contractors.

6. Licensure

The Contractor shall comply with and require all of its Subcontractors to comply with the license laws as required by the State of Utah.

7. Time is of the Essence

Time is of the essence in regard to all the requirements of the contract documents.

8. Bids

Before submitting a bid, each bidder shall carefully examine the contract documents; shall visit the site of the work; shall fully inform themselves as to all existing conditions and limitations; and shall include in the bid the cost of all items required by the contract documents including those added via addenda. If the bidder observes that portions of the contract documents are at variance with applicable laws, building codes, rules, regulations or contain obvious erroneous or uncoordinated information, the bidder shall promptly notify the DFCM Project Manager prior to the bidding deadline. Changes necessary to correct these issues will be made via addenda issued by DFCM.

The bid, bearing original signatures, must be typed or handwritten in ink on the Bid Form provided in the procurement documents and submitted in a sealed envelope at the location specified by the Invitation to Bid prior to the published deadline for the submission of bids.

Bid bond security, in the amount of five percent (5%) of the bid, made payable to the Division of Facilities Construction and Management, shall accompany bid. **THE BID BOND MUST BE ON THE BID BOND FORM PROVIDED IN THE PROCUREMENT DOCUMENTS IN ORDER TO BE CONSIDERED AN ACCEPTABLE BID.**

If the bid bond security is submitted on a form other than DFCM's required bid bond form, and the bid security meets all other legal requirements, the bidder will be allowed to provide an acceptable bid bond by the close of business on the next business day following notification by DFCM of submission of a defective bid bond security. **A cashier's check cannot be used as a substitute for a bid bond.**

9. Listing of Subcontractors

Listing of Subcontractors shall be as summarized in the "Instructions and Subcontractor's List Form", included as part of the contract documents. The subcontractors list shall be delivered to DFCM or faxed to DFCM at (801)538-3677 within 24 hours of the bid opening. Requirements for listing additional subcontractors will be listed in the contract documents.

DFCM retains the right to audit or take other steps necessary to confirm compliance with requirements for the listing and changing of subcontractors. Any contractor who is found to not be in compliance with these requirements may be suspended from DFCM's list of pre-qualified contractors.

10. Contract and Bond

The Contractor's Agreement will be in the form provided in this document. The duration of the contract shall be for the time indicated by the project completion deadline shown on the schedule. The successful bidder, simultaneously with the execution of the Contractor's Agreement, will be required to furnish a performance bond and a payment bond, both bearing original signatures, upon the forms provided in the procurement documents. The performance and payment bonds shall be for an amount equal to one hundred percent (100%) of the Contract Sum and secured from a company that meets the requirements specified in the requisite forms. Any bonding requirements for Subcontractors will be specified in the Supplementary General Conditions.

11. Award of Contract

The Contract will be awarded as soon as possible to the lowest, responsive and responsible bidder, based on the lowest combination of base bid and acceptable prioritized alternates, provided the bid is reasonable, is in the interests of DFCM to accept and after applying the Utah Preference Laws in U.C.A. Title 63, Chapter 56. DFCM reserves the right to waive any technicalities or formalities in any bid or in the bidding. Alternates will be accepted on a prioritized basis with Alternate 1 being highest priority, Alternate 2 having second priority, etc. Alternates will be selected in prioritized order up to the construction cost estimate.

12. Right to Reject Bids

DFCM reserves the right to reject any or all Bids.

13. Withdrawal of Bids

Bids may be withdrawn on written request received from bidders within 24 hours after the bid opening if the contractor has made an error in preparing the bid.

14. DFCM Contractor Performance Rating

As a contractor completes each project, DFCM will evaluate project performance based on the enclosed “DFCM Contractor Performance Rating” form. The ratings issued on this project may affect the firm’s “pre-qualified” status and their ability to obtain future work with DFCM.

**Division of Facilities Construction and Management****Stage II
PROJECT SCHEDULE**

PROJECT NAME: ROOFING IMPROVEMENTS - CENTER FOR PERSONS WITH DISABILITIES UTAH STATE UNIVERSITY – LOGAN, UTAH				
DFCM PROJECT #: 07017770				
Event	Day	Date	Time	Place
Stage II Bidding Documents Available	Friday	June 8, 2007	10:00 AM	Wasatch Building Utah State Fairpark Approx 155 North 1000 West Salt Lake City, UT **and DFCM web site *
Mandatory Pre-bid Site Meeting	Wednesday	June 13, 2007	2:00 PM	north side of CPD Building (see map on sheet G101) Utah State University Logan, UT
Deadline for Submitting Questions	Friday	June 15, 2007	1:00 PM	Darrell Hunting - DFCM E-mail dhunting@utah.gov Fax 801-538-8487
Prime Contractors Turn in Bid and Bid Bond	Wednesday	June 20, 2007	1:45 PM	Wasatch Building Utah State Fairpark Approx 155 North 1000 West Salt Lake City, UT **
Subcontractors List Due	Thursday	June 21, 2007	1:45 PM	DFCM 4110 State Office Building SLC, UT Fax 801-538-3677
Substantial Completion Date	Friday	August 24, 2007	5:00 PM	Project site

* **NOTE:** DFCM's web site address is <http://dfcm.utah.gov>

** **Due to the ongoing construction on Capitol Hill and the anticipated shortage of parking during 2007, all bids will be received and opened at the Wasatch Building at the Utah State Fairpark. Refer to map on the DFCM web site for directions (http://dfcm.utah.gov/downloads/fairpark_map.pdf)**

**Division of Facilities Construction and Management****BID FORM**

NAME OF BIDDER _____ DATE _____

To the Division of Facilities Construction and Management
4110 State Office Building
Salt Lake City, Utah 84114

The undersigned, responsive to the "Invitation to Bid" and in accordance with the Request for Bids for the, **ROOFING IMPROVEMENTS – CENTER FOR PERSONS WITH DISABILITIES BUILDING - UTAH STATE UNIVERSITY – LOGAN, UTAH - DFCM PROJECT NO. 07017770** and having examined the Contract Documents and the site of the proposed Work and being familiar with all of the conditions surrounding the construction of the proposed Project, including the availability of labor, hereby proposes to furnish all labor, materials and supplies as required for the Work in accordance with the Contract Documents as specified and within the time set forth and at the price stated below. This price is to cover all expenses incurred in performing the Work required under the Contract Documents of which this bid is a part:

I/We acknowledge receipt of the following Addenda: _____

For all work shown on the Drawings and described in the Specifications and Contract Documents, I/we agree to perform for the sum of:

_____ DOLLARS (\$_____)

(In case of discrepancy, written amount shall govern)

I/We guarantee that the Work will be Substantially Complete by **Friday, August 24, 2007**, should I/we be the successful bidder, and agree to pay liquidated damages in the amount of **\$250.00** per day for each day after expiration of the Contract Time as stated in Article 3 of the Contractor's Agreement.

This bid shall be good for 45 days after bid opening.

Enclosed is a 5% bid bond, as required, in the sum of _____

The undersigned Contractor's License Number for Utah is _____.

BID FORM
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Upon receipt of notice of award of this bid, the undersigned agrees to execute the contract within ten (10) days, unless a shorter time is specified in Contract Documents, and deliver acceptable Performance and Payment bonds in the prescribed form in the amount of 100% of the Contract Sum for faithful performance of the contract. The Bid Bond attached, in the amount not less than five percent (5%) of the above bid sum, shall become the property of the Division of Facilities Construction and Management as liquidated damages for delay and additional expense caused thereby in the event that the contract is not executed and/or acceptable 100% Performance and Payment bonds are not delivered within time set forth.

Type of Organization: _____
(Corporation, Partnership, Individual, etc.)

Any request and information related to Utah Preference Laws:

Respectfully submitted,

Name of Bidder

ADDRESS:

Authorized Signature

BID BOND

(Title 63, Chapter 56, U. C. A. 1953, as Amended)

KNOW ALL PERSONS BY THESE PRESENTS:

That _____ hereinafter referred to as the "Principal," and _____, a corporation organized and existing under the laws of the State of _____, with its principal office in the City of _____ and authorized to transact business in this State and U. S. Department of the Treasury Listed, (Circular 570, Companies Holding Certificates of Authority as Acceptable Securities on Federal Bonds and as Acceptable Reinsuring Companies); hereinafter referred to as the "Surety," are held and firmly bound unto the STATE OF UTAH, hereinafter referred to as the "Obligee," in the amount of \$ _____ (5% of the accompanying bid), being the sum of this Bond to which payment the Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that whereas the Principal has submitted to Obligee the accompanying bid incorporated by reference herein, dated as shown, to enter into a contract in writing for the _____ Project.

NOW, THEREFORE, THE CONDITION OF THE ABOVE OBLIGATION IS SUCH, that if the said principal does not execute a contract and give bond to be approved by the Obligee for the faithful performance thereof within ten (10) days after being notified in writing of such contract to the principal, then the sum of the amount stated above will be forfeited to the State of Utah as liquidated damages and not as a penalty; if the said principal shall execute a contract and give bond to be approved by the Obligee for the faithful performance thereof within ten (10) days after being notified in writing of such contract to the Principal, then this obligation shall be null and void. It is expressly understood and agreed that the liability of the Surety for any and all defaults of the Principal hereunder shall be the full penal sum of this Bond. The Surety, for value received, hereby stipulates and agrees that obligations of the Surety under this Bond shall be for a term of sixty (60) days from actual date of the bid opening.

PROVIDED, HOWEVER, that this Bond is executed pursuant to provisions of Title 63, Chapter 56, Utah Code Annotated, 1953, as amended, and all liabilities on this Bond shall be determined in accordance with said provisions to same extent as if it were copied at length herein.

IN WITNESS WHEREOF, the above bounden parties have executed this instrument under their several seals on the date indicated below, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

DATED this _____ day of _____, 20_____.

Principal's name and address (if other than a corporation):

By: _____

Title: _____

Principal's name and address (if a corporation):

By: _____

Title: _____
(Affix Corporate Seal)

Surety's name and address:

STATE OF _____)
) ss.
COUNTY OF _____)

By: _____
Attorney-in-Fact (Affix Corporate Seal)

On this ____ day of _____, 20____, personally appeared before me _____, whose identity is personally known to me or proved to me on the basis of satisfactory evidence, and who, being by me duly sworn, did say that he/she is the Attorney-in-fact of the above-named Surety Company, and that he/she is duly authorized to execute the same and has complied in all respects with the laws of Utah in reference to becoming sole surety upon bonds, undertakings and obligations, and that he/she acknowledged to me that as Attorney-in-fact executed the same.

Subscribed and sworn to before me this _____ day of _____, 20____.
My Commission Expires: _____
Resides at: _____

Agency: _____
Agent: _____
Address: _____
Phone: _____

NOTARY PUBLIC

Approved As To Form: May 25, 2005
By Alan S. Bachman, Asst Attorney General

**Division of Facilities Construction and Management****INSTRUCTION AND SUBCONTRACTORS LIST FORM**

The three low bidders, as well as all other bidders that desire to be considered, are required by law to submit to DFCM within 24 hours of bid opening a list of **ALL** first-tier subcontractors, including the subcontractor's name, bid amount and other information required by Building Board Rule and as stated in these Contract Documents, on the following basis:

PROJECTS UNDER \$500,000 - ALL SUBS \$20,000 OR OVER MUST BE LISTED
PROJECTS \$500,000 OR MORE - ALL SUBS \$35,000 OR OVER MUST BE LISTED

- Any additional subcontractors identified in the bid documents shall also be listed.
- The DFCM Director may not consider any bid submitted by a bidder if the bidder fails to submit a subcontractor list meeting the requirements of State law.
- List subcontractors for base bid as well as the impact on the list that the selection of any alternate may have.
- Bidder may not list more than one subcontractor to perform the same work.
- Bidder must list "Self" if performing work itself.

LICENSURE:

The subcontractor's name, the type of work, the subcontractor's bid amount, and the subcontractor's license number as issued by DOPL, if such license is required under Utah Law, shall be listed. Bidder shall certify that all subcontractors, required to be licensed, are licensed as required by State law. A subcontractor includes a trade contractor or specialty contractor and does not include suppliers who provide only materials, equipment, or supplies to a contractor or subcontractor.

BIDDER LISTING 'SELF' AS PERFORMING THE WORK:

Any bidder that is properly licensed for the particular work and intends to perform that work itself in lieu of a subcontractor that would otherwise be required to be on the subcontractor list, must insert the term 'Self' for that category on the subcontractor list form. Any listing of 'Self' on the sublist form shall also include the amount allocated for that work.

'SPECIAL EXCEPTION':

A bidder may list 'Special Exception' in place of a subcontractor when the bidder intends to obtain a subcontractor to perform the work at a later date because the bidder was unable to obtain a qualified or reasonable bid under the provisions of U.C.A. Section 63A-5-208(4). The bidder shall insert the term 'Special Exception' for that category of work, and shall provide documentation with the subcontractor list describing the bidder's efforts to obtain a bid of a qualified subcontractor at a reasonable cost and why the bidder was unable to obtain a qualified subcontractor bid. The Director must find that the bidder complied in good faith with State law requirements for any 'Special Exception' designation, in order for the bid to be considered. If awarded the contract, the Director shall supervise the bidder's efforts to obtain a qualified subcontractor bid. The amount of the awarded contract may not be adjusted to reflect the actual amount of the subcontractor's bid. Any listing of 'Special Exception' on the sublist form shall also include amount allocated for that work.

INSTRUCTIONS AND SUBCONTRACTORS LIST FORM
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GROUND FOR DISQUALIFICATION:

The Director may not consider any bid submitted by a bidder if the bidder fails to submit a subcontractor list meeting the requirements of State law. Director may withhold awarding the contract to a particular bidder if one or more of the proposed subcontractors are considered by the Director to be unqualified to do the Work or for such other reason in the best interest of the State of Utah. Notwithstanding any other provision in these instructions, if there is a good faith error on the sublist form, at the sole discretion of the Director, the Director may provide notice to the contractor and the contractor shall have 24 hours to submit the correction to the Director. If such correction is submitted timely, then the sublist requirements shall be considered met.

CHANGES OF SUBCONTRACTORS SPECIFICALLY IDENTIFIED ON SUBLIST FORM:

Subsequent to twenty-four hours after the bid opening, the contractor may change its listed subcontractors only after receiving written permission from the Director based on complying with all of the following criteria.

- (1) The contractor has established in writing that the change is in the best interest of the State and that the contractor establishes an appropriate reason for the change, which may include, but not is not limited to, the following reasons: the original subcontractor has failed to perform, or is not qualified or capable of performing, and/or the subcontractor has requested in writing to be released.
- (2) The circumstances related to the request for the change do not indicate any bad faith in the original listing of the subcontractors.
- (3) Any requirement set forth by the Director to ensure that the process used to select a new subcontractor does not give rise to bid shopping.
- (4) Any increase in the cost of the subject subcontractor work is borne by the contractor.
- (5) Any decrease in the cost of the subject subcontractor work shall result in a deductive change order being issued for the contract for such decreased amount.
- (6) The Director will give substantial weight to whether the subcontractor has consented in writing to being removed unless the Contractor establishes that the subcontractor is not qualified for the work.

EXAMPLE:

Example of a list where there are only four subcontractors:

TYPE OF WORK	SUBCONTRACTOR, "SELF" OR "SPECIAL EXCEPTION"	SUBCONTRACTOR BID AMOUNT	CONT. LICENSE #
ELECTRICAL	ABCD Electric Inc.	\$350,000.00	123456789000
LANDSCAPING	"Self"	300,000.00	123456789000
CONCRETE (ALTERNATE #1)	XYZ Concrete Inc	298,000.00	987654321000
MECHANICAL	"Special Exception" (attach documentation)	Fixed at: 350,000.00	(TO BE PROVIDED AFTER OBTAINING SUBCONTRACTOR)

**PURSUANT TO STATE LAW - SUBCONTRACTOR BID AMOUNTS CONTAINED IN THIS
SUBCONTRACTOR LIST SHALL NOT BE DISCLOSED UNTIL THE CONTRACT HAS BEEN AWARDED.**

**Division of Facilities Construction and Management****SUBCONTRACTORS LIST
FAX TO 801-538-3677****PROJECT TITLE:** _____**Caution:** You must read and comply fully with instructions.

TYPE OF WORK	SUBCONTRACTOR, "SELF" OR "SPECIAL EXCEPTION"	SUBCONTRACTOR BID AMOUNT	CONT. LICENSE #

We certify that:

1. This list includes all subcontractors as required by the instructions, including those related to the base bid as well as any alternates.
2. We have listed "Self" or "Special Exception" in accordance with the instructions.
3. All subcontractors are appropriately licensed as required by State law.

FIRM: _____

DATE: _____

SIGNED BY: _____

NOTICE: FAILURE TO SUBMIT THIS FORM, PROPERLY COMPLETED AND SIGNED, AS REQUIRED IN THESE CONTRACT DOCUMENTS, SHALL BE GROUNDS FOR DFCMS REFUSAL TO ENTER INTO A WRITTEN CONTRACT WITH BIDDER. ACTION MAY BE TAKEN AGAINST BIDDERS BID BOND AS DEEMED APPROPRIATE BY DFCM. ATTACH A SECOND PAGE IF NECESSARY.

CONTRACTOR'S AGREEMENT

FOR:

THIS CONTRACTOR'S AGREEMENT, made and entered into this ____ day of _____, 20__, by and between the DIVISION OF FACILITIES CONSTRUCTION AND MANAGEMENT, hereinafter referred to as "DFCM", and _____, incorporated in the State of _____ and authorized to do business in the State of Utah, hereinafter referred to as "Contractor", whose address is _____.

WITNESSETH: WHEREAS, DFCM intends to have Work performed at _____.

WHEREAS, Contractor agrees to perform the Work for the sum stated herein.

NOW, THEREFORE, DFCM and Contractor for the consideration provided in this Contractor's Agreement, agree as follows:

ARTICLE 1. SCOPE OF WORK. The Work to be performed shall be in accordance with the Contract Documents prepared by _____ and entitled "_____"

The DFCM General Conditions ("General Conditions") dated May 25, 2005 on file at the office of DFCM and available on the DFCM website, are hereby incorporated by reference as part of this Agreement and are included in the specifications for this Project. All terms used in this Contractor's Agreement shall be as defined in the Contract Documents, and in particular, the General Conditions.

The Contractor Agrees to furnish labor, materials and equipment to complete the Work as required in the Contract Documents which are hereby incorporated by reference. It is understood and agreed by the parties hereto that all Work shall be performed as required in the Contract Documents and shall be subject to inspection and approval of DFCM or its authorized representative. The relationship of the Contractor to the DFCM hereunder is that of an independent Contractor.

ARTICLE 2. CONTRACT SUM. The DFCM agrees to pay and the Contractor agrees to accept in full performance of this Contractor's Agreement, the sum of _____ DOLLARS AND NO CENTS (\$_____.00), which is the base bid, and which sum also includes the cost of a 100%

CONTRACTOR'S AGREEMENT
PAGE NO. 2

Performance Bond and a 100% Payment Bond as well as all insurance requirements of the Contractor. Said bonds have already been posted by the Contractor pursuant to State law. The required proof of insurance certificates have been delivered to DFCM in accordance with the General Conditions before the execution of this Contractor's Agreement.

ARTICLE 3. TIME OF COMPLETION AND DELAY REMEDY. The Work shall be Substantially Complete by _____. Contractor agrees to pay liquidated damages in the amount of \$_____ per day for each day after expiration of the Contract Time until the Contractor achieves Substantial Completion in accordance with the Contract Documents, if Contractor's delay makes the damages applicable. The provision for liquidated damages is: (a) to compensate the DFCM for delay only; (b) is provided for herein because actual damages can not be readily ascertained at the time of execution of this Contractor's Agreement; (c) is not a penalty; and (d) shall not prevent the DFCM from maintaining Claims for other non-delay damages, such as costs to complete or remedy defective Work.

No action shall be maintained by the Contractor, including its or Subcontractor or suppliers at any tier, against the DFCM or State of Utah for damages or other claims due to losses attributable to hindrances or delays from any cause whatsoever, including acts and omissions of the DFCM or its officers, employees or agents, except as expressly provided in the General Conditions. The Contractor may receive a written extension of time, signed by the DFCM, in which to complete the Work under this Contractor's Agreement in accordance with the General Conditions.

ARTICLE 4. CONTRACT DOCUMENTS. The Contract Documents consist of this Contractor's Agreement, the Conditions of the Contract (DFCM General Conditions, Supplementary and other Conditions), the Drawings, Specifications, Addenda and Modifications. The Contract Documents shall also include the bidding documents, including the Notice to Contractors, Instructions to Bidders/Proposers and the Bid/Proposal, to the extent not in conflict therewith and other documents and oral presentations that are documented as an attachment to the contract.

All such documents are hereby incorporated by reference herein. Any reference in this Contractor's Agreement to certain provisions of the Contract Documents shall in no way be construed as to lessen the importance or applicability of any other provisions of the Contract Documents.

ARTICLE 5. PAYMENT. The DFCM agrees to pay the Contractor from time to time as the Work progresses, but not more than once each month after the date of Notice to Proceed, and only upon Certificate of the A/E for Work performed during the preceding calendar month, ninety-five percent (95%) of the value of the labor performed and ninety-five percent (95%) of the value of materials furnished in place or on the site. The Contractor agrees to furnish to the DFCM invoices for materials purchased and on the site but not installed, for which the

CONTRACTOR'S AGREEMENT
PAGE NO. 3

Contractor requests payment and agrees to safeguard and protect such equipment or materials and is responsible for safekeeping thereof and if such be stolen, lost or destroyed, to replace same.

Such evidence of labor performed and materials furnished as the DFCM may reasonably require shall be supplied by the Contractor at the time of request for Certificate of Payment on account. Materials for which payment has been made cannot be removed from the job site without DFCM's written approval. Five percent (5%) of the earned amount shall be retained from each monthly payment. The retainage, including any additional retainage imposed and the release of any retainage, shall be in accordance with UCA 13-8-5 as amended. Contractor shall also comply with the requirements of UCA 13-8-5, including restrictions of retainage regarding subcontractors and the distribution of interest earned on the retention proceeds. The DFCM shall not be responsible for enforcing the Contractor's obligations under State law in fulfilling the retention law requirements with subcontractors at any tier.

ARTICLE 6. INDEBTEDNESS. Before final payment is made, the Contractor must submit evidence satisfactory to the DFCM that all payrolls, materials bills, subcontracts at any tier and outstanding indebtedness in connection with the Work have been properly paid. Final Payment will be made after receipt of said evidence, final acceptance of the Work by the DFCM as well as compliance with the applicable provisions of the General Conditions.

Contractor shall respond immediately to any inquiry in writing by DFCM as to any concern of financial responsibility and DFCM reserves the right to request any waivers, releases or bonds from Contractor in regard to any rights of Subcontractors (including suppliers) at any tier or any third parties prior to any payment by DFCM to Contractor.

ARTICLE 7. ADDITIONAL WORK. It is understood and agreed by the parties hereto that no money will be paid to the Contractor for additional labor or materials furnished unless a new contract in writing or a Modification hereof in accordance with the General Conditions and the Contract Documents for such additional labor or materials has been executed. The DFCM specifically reserves the right to modify or amend this Contractor's Agreement and the total sum due hereunder either by enlarging or restricting the scope of the Work.

ARTICLE 8. INSPECTIONS. The Work shall be inspected for acceptance in accordance with the General Conditions.

ARTICLE 9. DISPUTES. Any dispute, PRE or Claim between the parties shall be subject to the provisions of Article 7 of the General Conditions. DFCM reserves all rights to pursue its rights and remedies as provided in the General Conditions.

ARTICLE 10. TERMINATION, SUSPENSION OR ABANDONMENT. This Contractor's Agreement may be terminated, suspended or abandoned in accordance with the General Conditions.

ARTICLE 11. DFCM'S RIGHT TO WITHHOLD CERTAIN AMOUNT AND MAKE USE THEREOF. The DFCM may withhold from payment to the Contractor such amount as, in DFCM's judgment, may be necessary to pay just claims against the Contractor or Subcontractor at any tier for labor and services rendered and materials furnished in and about the Work. The DFCM may apply such withheld amounts for the payment of such claims in DFCM's discretion. In so doing, the DFCM shall be deemed the agent of Contractor and payment so made by the DFCM shall be considered as payment made under this Contractor's Agreement by the DFCM to the Contractor. DFCM shall not be liable to the Contractor for any such payment made in good faith. Such withholdings and payments may be made without prior approval of the Contractor and may be also be prior to any determination as a result of any dispute, PRE, Claim or litigation.

ARTICLE 12. INDEMNIFICATION. The Contractor shall comply with the indemnification provisions of the General Conditions.

ARTICLE 13. SUCCESSORS AND ASSIGNMENT OF CONTRACT. The DFCM and Contractor, respectively bind themselves, their partners, successors, assigns and legal representatives to the other party to this Agreement, and to partners, successors, assigns and legal representatives of such other party with respect to all covenants, provisions, rights and responsibilities of this Contractor's Agreement. The Contractor shall not assign this Contractor's Agreement without the prior written consent of the DFCM, nor shall the Contractor assign any moneys due or to become due as well as any rights under this Contractor's Agreement, without prior written consent of the DFCM.

ARTICLE 14. RELATIONSHIP OF THE PARTIES. The Contractor accepts the relationship of trust and confidence established by this Contractor's Agreement and covenants with the DFCM to cooperate with the DFCM and A/E and use the Contractor's best skill, efforts and judgment in furthering the interest of the DFCM; to furnish efficient business administration and supervision; to make best efforts to furnish at all times an adequate supply of workers and materials; and to perform the Work in the best and most expeditious and economic manner consistent with the interests of the DFCM.

ARTICLE 15. AUTHORITY TO EXECUTE AND PERFORM AGREEMENT. Contractor and DFCM each represent that the execution of this Contractor's Agreement and the performance thereunder is within their respective duly authorized powers.

ARTICLE 16. ATTORNEY FEES AND COSTS. Except as otherwise provided in the dispute resolution provisions of the General Conditions, the prevailing party shall be entitled to reasonable attorney fees and costs incurred in any action in the District Court and/or appellate body to enforce this Contractor's Agreement or recover damages or any other action as a result of a breach thereof.

CONTRACTOR'S AGREEMENT
PAGE NO. 5

IN WITNESS WHEREOF, the parties hereto have executed this Contractor's Agreement on the day and year stated hereinabove.

CONTRACTOR: _____

Signature Date

Title: _____

State of _____)
_____)
County of _____)

Please type/print name clearly

On this ____ day of _____, 20____, personally appeared before me, _____, whose identity is personally known to me (or proved to me on the basis of satisfactory evidence) and who by me duly sworn (or affirmed), did say that he (she) is the _____ (title or office) of the firm and that said document was signed by him (her) in behalf of said firm.

(SEAL)

Notary Public

My Commission Expires _____

APPROVED AS TO AVAILABILITY
OF FUNDS:

David D. Williams, Jr. Date
DFCM Administrative Services Director

**DIVISION OF FACILITIES
CONSTRUCTION AND MANAGEMENT**

_____- Manager Date
Capital Development/Improvements

APPROVED AS TO FORM:
ATTORNEY GENERAL
November 30, 2006
By: Alan S. Bachman
Asst Attorney General

APPROVED FOR EXPENDITURE:

Division of Finance Date

PERFORMANCE BOND

(Title 63, Chapter 56, U. C. A. 1953, as Amended)

That _____ hereinafter referred to as the "Principal" and _____, a corporation organized and existing under the laws of the State of _____, with its principal office in the City of _____ and authorized to transact business in this State and U. S. Department of the Treasury Listed (Circular 570, Companies Holding Certificates of Authority as Acceptable Securities on Federal Bonds and as Acceptable Reinsuring Companies); hereinafter referred to as the "Surety," are held and firmly bound unto the State of Utah, hereinafter referred to as the "Obligee," in the amount of _____ DOLLARS (\$ _____) for the payment whereof, the said Principal and Surety bind themselves and their heirs, administrators, executors, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered into a certain written Contract with the Obligee, dated the _____ day of _____, 20____, to construct _____ in the County of _____, State of Utah, Project No. _____, for the approximate sum of _____ Dollars (\$ _____), which Contract is hereby incorporated by reference herein.

NOW, THEREFORE, the condition of this obligation is such that if the said Principal shall faithfully perform the Contract in accordance with the Contract Documents including, but not limited to, the Plans, Specifications and conditions thereof, the one year performance warranty, and the terms of the Contract as said Contract may be subject to Modifications or changes, then this obligation shall be void; otherwise it shall remain in full force and effect.

No right of action shall accrue on this bond to or for the use of any person or corporation other than the state named herein or the heirs, executors, administrators or successors of the Owner.

The parties agree that the dispute provisions provided in the Contract Documents apply and shall constitute the sole dispute procedures of the parties.

PROVIDED, HOWEVER, that this Bond is executed pursuant to the Provisions of Title 63, Chapter 56, Utah Code Annotated, 1953, as amended, and all liabilities on this Bond shall be determined in accordance with said provisions to the same extent as if it were copied at length herein.

IN WITNESS WHEREOF, the said Principal and Surety have signed and sealed this instrument this _____ day of _____, 20____.

WITNESS OR ATTESTATION:

PRINCIPAL:

By: _____

(Seal)

Title: _____

WITNESS OR ATTESTATION:

SURETY:

By: _____

Attorney-in-Fact (Seal)

STATE OF _____)
) ss.
COUNTY OF _____)

On this _____ day of _____, 20____, personally appeared before me _____, whose identity is personally known to me or proved to me on the basis of satisfactory evidence, and who, being by me duly sworn, did say that he/she is the Attorney in-fact of the above-named Surety Company and that he/she is duly authorized to execute the same and has complied in all respects with the laws of Utah in reference to becoming sole surety upon bonds, undertakings and obligations, and that he/she acknowledged to me that as Attorney-in-fact executed the same.

Subscribed and sworn to before me this _____ day of _____, 20____.

My commission expires: _____

Resides at: _____

NOTARY PUBLIC

Agency: _____
Agent: _____
Address: _____
Phone: _____

Approved As To Form: May 25, 2005
By Alan S. Bachman, Asst Attorney General

PAYMENT BOND

(Title 63, Chapter 56, U. C. A. 1953, as Amended)

KNOW ALL PERSONS BY THESE PRESENTS:

That _____ hereinafter referred to as the "Principal," and _____, a corporation organized and existing under the laws of the State of _____ authorized to do business in this State and U. S. Department of the Treasury Listed (Circular 570, Companies Holding Certificates of Authority as Acceptable Securities on Federal Bonds and as Acceptable Reinsuring Companies); with its principal office in the City of _____, hereinafter referred to as the "Surety," are held and firmly bound unto the State of Utah hereinafter referred to as the "Obligee," in the amount of _____ Dollars (\$ _____) for the payment whereof, the said Principal and Surety bind themselves and their heirs, administrators, executors, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered into a certain written Contract with the Obligee, dated the _____ day of _____, 20____, to construct _____ in the County of _____, State of Utah, Project No. _____ for the approximate sum of _____ Dollars (\$ _____), which contract is hereby incorporated by reference herein.

NOW, THEREFORE, the condition of this obligation is such that if the said Principal shall pay all claimants supplying labor or materials to Principal or Principal's Subcontractors in compliance with the provisions of Title 63, Chapter 56, of Utah Code Annotated, 1953, as amended, and in the prosecution of the Work provided for in said Contract, then, this obligation shall be void; otherwise it shall remain in full force and effect.

That said Surety to this Bond, for value received, hereby stipulates and agrees that no changes, extensions of time, alterations or additions to the terms of the Contract or to the Work to be performed thereunder, or the specifications or drawings accompanying same shall in any way affect its obligation on this Bond, and does hereby waive notice of any such changes, extensions of time, alterations or additions to the terms of the Contract or to the Work or to the specifications or drawings and agrees that they shall become part of the Contract Documents.

PROVIDED, HOWEVER, that this Bond is executed pursuant to the provisions of Title 63, Chapter 56, Utah Code Annotated, 1953, as amended, and all liabilities on this Bond shall be determined in accordance with said provisions to the same extent as if it were copied at length herein.

IN WITNESS WHEREOF, the said Principal and Surety have signed and sealed this instrument this _____ day of _____, 20____.

WITNESS OR ATTESTATION:

PRINCIPAL:

By: _____

(Seal)

Title: _____

WITNESS OR ATTESTATION:

SURETY:

By: _____

Attorney-in-Fact (Seal)

STATE OF _____)

) ss.

COUNTY OF _____)

On this _____ day of _____, 20____, personally appeared before me _____, whose identity is personally known to me or proved to me on the basis of satisfactory evidence, and who, being by me duly sworn, did say that he/she is the Attorney-in-fact of the above-named Surety Company, and that he/she is duly authorized to execute the same and has complied in all respects with the laws of Utah in reference to becoming sole surety upon bonds, undertakings and obligations, and that he/she acknowledged to me that as Attorney-in-fact executed the same.

Subscribed and sworn to before me this _____ day of _____, 20____.

My commission expires: _____

Resides at: _____

NOTARY PUBLIC

Agency: _____
Agent: _____
Address: _____
Phone: _____

Approved As To Form: May 25, 2005
By Alan S. Bachman, Asst Attorney General

**Division of Facilities Construction and Management****DFCM****CERTIFICATE OF SUBSTANTIAL COMPLETION**

PROJECT _____ PROJECT NO: _____

AGENCY/INSTITUTION _____

AREA ACCEPTED _____

The Work performed under the subject Contract has been reviewed on this date and found to be Substantially Completed as defined in the General Conditions; including that the construction is sufficiently completed in accordance with the Contract Documents, as modified by any change orders agreed to by the parties, so that the State of Utah can occupy the Project or specified area of the Project for the use for which it is intended.

The DFCM - (Owner) accepts the Project or specified area of the Project as Substantially Complete and will assume full possession of the Project or specified area of the Project at _____ (time) on _____ (date).

The DFCM accepts the Project for occupancy and agrees to assume full responsibility for maintenance and operation, including utilities and insurance, of the Project subject to the itemized responsibilities and/or exceptions noted below:

The Owner acknowledges receipt of the following closeout and transition materials:

Record Drawings

O & M Manuals

Warranty Documents

Completion of Training
Requirements

A list of items to be completed or corrected (Punch List) is attached hereto. The failure to include an item on it does not alter the responsibility of the Contractor to complete all the Work in accordance with the Contract Documents, including authorized changes thereof. The amount of _____. (Twice the value of the punch list work) shall be retained to assure the completion of the punch list work.

The Contractor shall complete or correct the Work on the list of (Punch List) items appended hereto within _____ calendar days from the above date of issuance of this Certificate. If the list of items is not completed within the time allotted the Owner has the right to be compensated for the delays and/or complete the work with the help of independent contractor at the expense of the retained project funds. If the retained project funds are insufficient to cover the delay/completion damages, the Owner shall be promptly reimbursed for the balance of the funds needed to compensate the Owner.

CONTRACTOR (include name of firm) by: _____
(Signature) DATE

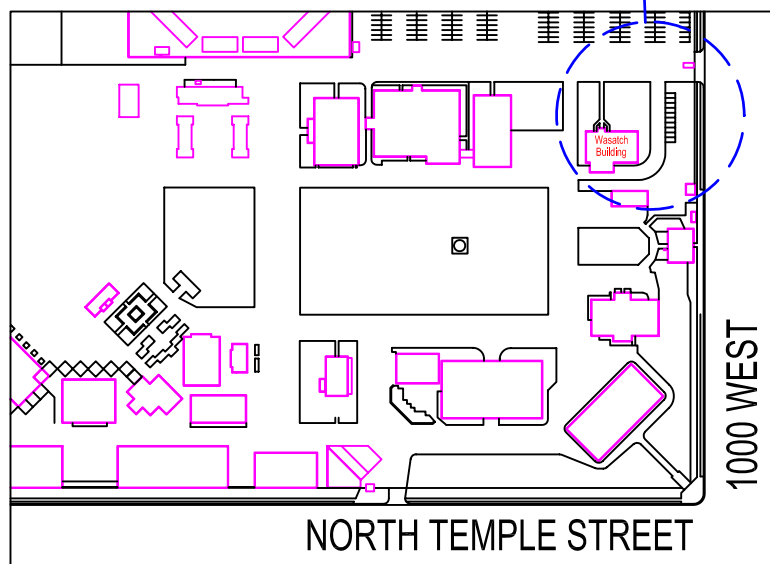
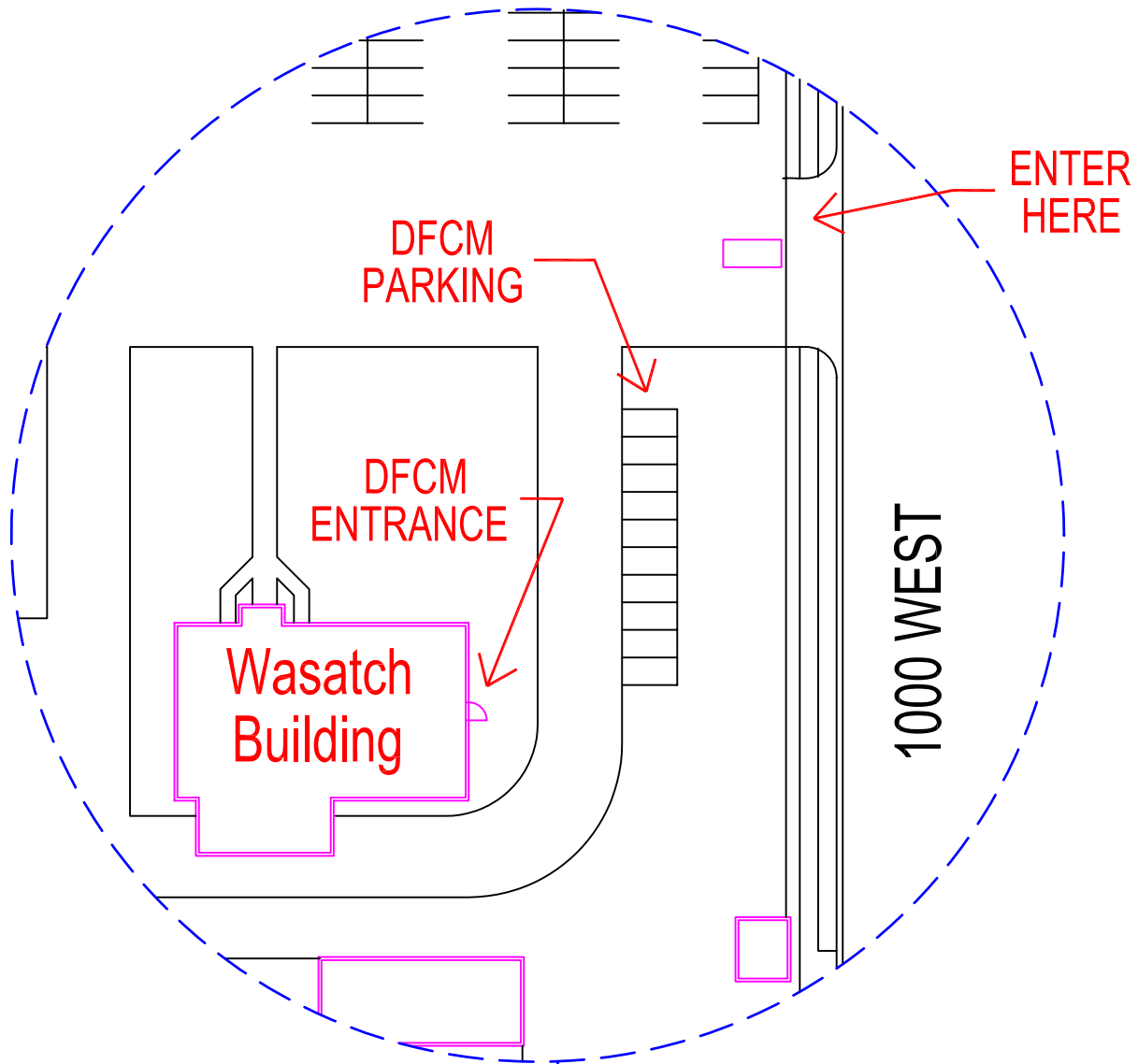
A/E (include name of firm) by: _____
(Signature) DATE

USING INSTITUTION OR AGENCY by: _____
(Signature) DATE

DFCM (Owner) by: _____
(Signature) DATE

4110 State Office Building, Salt Lake City, Utah 84114
telephone 801-538-3018 • facsimile 801-538-3267 • <http://dfcm.utah.gov>

cc: Parties Noted
DFCM, Director



UTAH STATE
FAIR PARK



DFCM Temporary Location

**STATE OF UTAH
DIVISION OF FACILITIES CONSTRUCTION AND MANAGEMENT**

**UTAH STATE UNIVERSITY
CENTER FOR PERSONS WITH DISABILITIES
ROOFING IMPROVEMENTS**

PROJECT NUMBER: 07017770

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SECTION 05 5214

GALVANIZED STEEL PIPE AND TUBE RAILINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Includes But Not Limited To:
 - 1. Furnish and install galvanized steel pipe handrails as described in Contract Documents.
- B. Products Supplied But Not Installed Under This Section:
 - 1. Anchoring sleeves in concrete (if used).
- C. Related Sections:
 - 1. Section 03 3111: Installation of anchoring sleeves.
 - 2. Section 05 0503: Quality of priming and repair of galvanizing.
 - 3. Section 05 0523: Quality of welding.
 - 4. Section 06 1100: Blocking for handrail brackets installed on wood-framed walls.
 - 5. Section 06 4115: Wood handrails to Rostrum.
 - 6. Section 09 2216: Blocking for handrail brackets installed on metal-framed walls.
 - 7. Finish painting:
 - a. Exterior: Section 09 9113.
 - b. Interior: Section 09 9124.
 - 8. Section 10 2813: Grab bars in Rest Rooms.

1.2 REFERENCES

- A. American Society For Testing And Materials:
 - 1. ASTM A 36-03a, 'Standard Specification for Carbon Structural Steel.'
 - 2. ASTM A 53-02, 'Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.'
 - 3. ASTM A 123-02, 'Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.'
 - 4. ASTM A 501-01, 'Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.'
 - 5. ASTM C 1107-02, 'Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).'

1.3 SUBMITTALS

- A. Shop Drawings: Show fabrication and installation of handrails and railings including floor plans, elevations, sections, details of components, and attachments to other elements of The Work.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Storage:
 - 1. Store handrails and railing systems in clean, dry location, away from uncured concrete and masonry, and protected against damage.
 - 2. Cover with waterproof paper, tarpaulin, or polyethylene sheeting. Allow for air circulation inside covering.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Handrails, Railings, And Balusters: Galvanized steel pipe meeting requirements of ASTM A 53 or galvanized steel tubing meeting requirements of ASTM A 501.
- B. Sleeves:
 - 1. 6 to 9 inches 150 to 225 mm long with cross-section shape and dimension to allow 1/2 inch 13 mm minimum of grout around perimeter of pipe or tube.
 - 2. Provide with fully welded steel plate forming bottom closure.
- C. Rail Setting Grout:
 - 1. Commercial nonshrink grout conforming to requirements of ASTM C 1107, Type B or Type C.
 - 2. Type Three Approved Manufacturers:
 - a. Normal Construction Grout A by Bonsal American, Charlotte, NC www.bonsal.com.
 - b. Advantage 1107 Grout by Dayton Superior Concrete Chemicals, Miamisburg, IL www.daytonsuperiorchemical.com.
 - c. NS Grout by Euclid Chemical Co, Cleveland, OH www.euclidchemical.com
 - d. 5 Star Special Grout 110 by Five Star Products Inc, Fairfield, CT www.fivestarproducts.com.
 - e. Duragrout by L&M Construction Chemicals Inc, Omaha, NE www.lmcc.com
 - f. Sonneborn / deGussa Building Systems, Shakopee, MN www.chemrex.com.
 - g. Tamms Grout 621 by TAMMS Industries, Mentor, OH www.tamms.com.
 - h. U S Spec MP Grout by U S Mix Products Co www.usspec.com.
 - i. CG-86 Grout by W R Meadows, Hampshire, IL www.wrmeadows.com.
 - j. Equal as approved by Architect before use. See Section 01 6000.

2.2 FABRICATION

- A. General:
 - 1. Preassemble railing systems in shop to greatest extent possible to minimize field splicing and assembly.
 - 2. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.
 - 3. Grind smooth welded joints and buff welds to same appearance as remainder of railing. Repair galvanizing and cut pipe ends as specified in Section 05 0503.
 - 4. Return pipe ends of wall mounted handrails into wall.
 - 5. Cap pipe ends of floor / ground mounted handrails and exterior handrails.
 - 6. After fabrication, shop prime metal to be painted.
- B. Form curves by bending pipe in jigs to produce uniform curvature for each configuration required. Maintain cylindrical cross-section of pipe throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of pipe.
- C. Welded Connections:
 - 1. Fabricate railing system and handrail connections by welding.
 - 2. Weld corners and seams continuously to comply with following:
 - a. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - b. At tee and cross intersections, notch ends of intersecting members to fit contour of pipe to which end is joined and weld all around.
 - c. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and so contours of welded surfaces match adjacent surfaces.
- D. Brackets, Flanges, Fittings, And Anchors:

1. Provide standard wall brackets, flanges, miscellaneous fittings, and anchors for connection of handrails and railings to other construction.
2. Provide inserts and other anchorage devices for connecting handrails and railing systems to concrete or masonry work.

2.3 FINISH

- A. Factory-applied powder-coated finish. Color as selected by Architect from Manufacturer's standard colors.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Coring of concrete for installation of balusters is acceptable. Core diameter shall be same as inside diameter of metal sleeves.
- B. Touch up field welds to match pre-finished material.

END OF SECTION

SECTION 06 0573

PRESERVATIVE WOOD TREATMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Includes But Not Limited To:
 - 1. Quality of wood preservative treatment where specified.
- B. Related Sections:
 - 1. Section 06 1100:
 - a. Characteristics of wood to be pressure-treated.
 - b. Furnishing and installing of pressure-treated wood.

1.2 REFERENCES

- A. American Wood-Preserver's Association:
 - 1. AWPA C1-96, 'All Timber Products, Pressure Treatment.'
 - 2. AWPA C2-96, 'Lumber, Timbers, Bridge Ties and Mine Ties, Pressure Treatment.'
 - 3. AWPA C31-xx, 'Lumber Used Out of Contact with the Ground and Continuously Protected from Liquid Water.'
 - 4. AWPA C33-xx, 'Standard for Preservative Treatment of Structural Composite Lumber by Pressure Processes.'
 - 5. AWPA P5-xx, 'Waterborne Preservatives.'
 - 6. AWPA N1-96, 'All Millwork, Preservative Treatment by Non-Pressure Process.'

1.3 SUBMITTALS

- A. Quality Assurance / Control: Certificate of pressure treatment showing compliance with specification requirements and including information required under IBC Section 2303.1.8.1.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Pressure Treatment Of Wood:
 - 1. Framing lumber grade and species shall be as specified in Section 06 1100 for particular use.
 - 2. Interior Wood In Contact With Concrete or Masonry:
 - a. Preservatives:
 - 1) Disodium octoborate tetrahydrate (DOT / SBX) meeting requirements of AWPA C31 and with retention of 0.25 lbs per cu ft 4 kg per cu meter.
 - 2) Zinc borate meeting requirements of AWPA C33 and with retention of 0.17 lbs per cu ft 2.7 kg per cu meter.
 - b. Lumber: Treat in accordance with AWPA C31 or C33 and dry after treatment.
 - c. Millwork: Treat in accordance with AWPA N1 and dry after treatment.
 - 3. Exterior Wood Continuously Exposed To Weather:
 - a. Preservatives: Waterborne preservatives meeting requirements of AWPA C2 with retention levels as required by AWPA C2 for specific application.

- b. Lumber: Treat in accordance with AWWPA C2 and dry after treatment.
- B. Type One Acceptable Manufacturers:
 - 1. Arch Wood Protection Inc, Smyrna, GA www.wolmanizedwood.com.
 - 2. Chemical Specialties Inc, Charlotte, NC www.treatedwood.com.
 - 3. Hoover Treated Wood Products, Thomson, GA www.frtw.com.
 - 4. Osmose Inc, Griffin, GA www.osmose.com.
 - 5. U S Borax Inc, Valencia, CA www.borax.com/wood.
 - 6. Equal as approved by Architect before bidding. See Section 01 6200.

PART 3 - EXECUTION: Not Used

END OF SECTION

SECTION 06 1011
WOOD FASTENINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Includes But Not Limited To:
 - 1. Quality of wood fastening methods and materials unless specified otherwise.
- B. Related Sections:
 - 1. Furnishing and installing of fasteners specified in individual Sections where installed.

1.2 REFERENCES

- A. American Society For Testing And Materials:
 - 1. ASTM F 1667-02a, 'Standard Specification for Driven Fasteners: Nails, Spikes, and Staples.'

1.3 DEFINITIONS

- A. Nail Terminology:
 - 1. When following nail terms are used in relation to this Project, following lengths and diameters will be understood. Refer to nails of other dimensions by actual length and diameter, not by one of listed terms:

Nail Term	Length	Diameter	Length	Diameter
8d Box	2-1/2 inches	0.113 inch	63.5 mm	2.827 mm
8d Common	2-1/2 inches	0.131 inch	63.5 mm	3.389 mm
10d Box	3 inches	0.128 inch	76.2 mm	3.251 mm
10d Common	3 inches	0.148 inch	76.2 mm	3.759 mm
16d Box	3-1/2 inches	0.135 inch	88.9 mm	3.411 mm
16d Sinker	3-1/4 inches	0.148 inch	82.6 mm	3.759 mm
16d Common	3-1/2 inches	0.162 inch	88.9 mm	4.115 mm

1.4 SUBMITTALS

- A. Shop Drawings:
 - 1. Submit diameter and lengths of fasteners proposed for use on Project. If length or diameter of proposed fasteners differ from specified fasteners, also include technical and engineering data for proposed fasteners including, but not limited to:
 - a. Adjusted fastener spacing where using proposed fasteners and,
 - b. Adjusted number of fasteners necessary to provide connection capacity equivalent to specified fasteners.
 - 2. Submit on powder-actuated fasteners other than those specified in Contract Documents showing design criteria equivalents at each application.
 - 3. Show type, quantity, and installation location of framing anchors. Where necessary, reference Drawing details, etc, for installation locations.
- B. Quality Assurance / Control: Manufacturer's literature on framing anchors and powder actuated fasteners.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Fasteners:

1. Fasteners in contact with preservative treated wood shall be hot-dipped galvanized or G-185 coated.
2. Nails:
 - a. Meet requirements of ASTM F 1667.
 - b. Unless noted otherwise, nails listed on Drawings or in Specifications shall be common nail diameter, except 16d nails, which shall be box diameter.
3. Wood Screws: Standard type and make for job requirements.
4. Powder-Actuated Fasteners:
 - a. Class Two Quality Standard: Hilti X-DNI 62P8.
 - b. Manufacturers:
 - 1) Hilti, Tulsa, OK www.hilti.com.
 - 2) Ramset / Redhead Division of ITW, Wood Dale, IL www.ramset-redhead.com and Markham, ON www.itwconstruction.ca.
 - 3) Equals as approved by Architect through shop drawing submittal before installation. See Section 01 6000.
5. Expansion Bolts:
 - a. Type Two Acceptable Products:
 - 1) Kwik Bolt 3 by Hilti, Tulsa, OK www.hilti.com.
 - 2) Trubolt by Ramset / Redhead Division of ITW, Wood Dale, IL www.ramset-redhead.com and Markham, ON www.itwconstruction.ca.
 - 3) Equals as approved by Architect through shop drawing submittal before installation. See Section 01 6000.
6. Screw Anchors:
 - a. Type Two Acceptable Products:
 - 1) HUS-H Screw Anchor by Hilti, Tulsa, OK www.hilti.com.
 - 2) Titen HD by Simpson Strong Tie Co, Dublin, CA www.strongtie.com.
 - 3) Equals as approved by Architect through shop drawing submittal before installation. See Section 01 6000.

B. Adhesives:

1. Construction Mastics: Meet requirements of American Plywood Association Specification AFG-01 September 1974. Use phenol-resorcinol type for use on pressure treated wood products.

C. Framing Anchors:

1. Framing anchors and associated fasteners in contact with preservative treated wood shall be hot-dipped galvanized, G-185 coated, or stainless steel. However, do not use stainless steel items with galvanized items.
2. Type Two Acceptable Products:
 - a. Advanced Connector Systems (ACS), Tempe, AZ www.acsboss.com.
 - b. KC Metals Inc, San Jose, CA www.kcmetals.com.
 - c. Simpson Strong Tie Co, Dublin, CA www.strongtie.com.
 - d. United Steel Products Co Inc (USP), Montgomery, MN www.uspconnectors.com.
 - e. Equals as approved by Architect through shop drawing submittal before installation. See Section 01 6000.

PART 3 - EXECUTION

3.1 ERECTION

- A. Secure one Manufacturer approved fastener in each hole of framing anchor that bears on framing member unless approved otherwise in writing by Architect. 'Boss' system by ACS is acceptable nailing system for framing anchors.
- B. Provide bolt heads and nuts bearing on wood with washers.

END OF SECTION

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SECTION 06 1100

WOOD FRAMING

PART 1 - GENERAL

1.1 SUMMARY

- A. Includes But Not Limited To:
 - 1. Furnish and install wood framing and blocking as described in Contract Documents.
- B. Related Sections:
 - 1. Section 06 0573: Quality of Preservative Wood Treatment.

1.2 REFERENCES

- A. Truss Plate Institute:
 - 1. TPI / WTCA Booklet BCSI-03, 'Guide for Handling, Installing, Installing, and Bracing of Metal Plate Connected Wood Trusses.'
- B. U. S. Department of Commerce:
 - 1. Voluntary Product Standard DOC PS 20-99, 'American Softwood Lumber Standard.'

1.3 DELIVERY, STORAGE, AND HANDLING

- A. Protect lumber and plywood and keep under cover in transit and at job site.
- B. Do not deliver material unduly long before it is required.
- C. Store lumber and plywood on level racks and keep free of ground to avoid warping. Stack to insure proper ventilation and drainage.
- D. Handle and store wood trusses in accordance with TPI / WTCA Booklet BCSI, except trusses may be unloaded by dumping if trusses are shipped horizontally, are rolled off low profile roller bed trailer, and no part of any truss is required to drop more than 18 inches 450 mm.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Dimension Lumber:
 - 1. Meet requirements of PS 20 and National Grading Rules for softwood dimension lumber.
 - 2. Bear grade stamp of WWPA, SPIB, or other association recognized by American Lumber Standards Committee identifying species of lumber by grade mark or by Certificate of Inspection.
 - 3. Identify lumber and plywood by grade mark or Certificate of Inspection issued by approved lumber grading or inspection bureau or agency. Graded American lumber may be used, subject to CLSAB approval.
 - 4. Lumber 2 inches 50 mm or less in nominal thickness shall not exceed 19 percent in moisture content at time of fabrication and installation and be stamped 'S-DRY', 'K-D', or 'MC15.'
 - 5. Lumber shall be S4S.
 - 6. Preservative Treated Plates / Sills:

- a. 2x4 38 mm by 64 mm: Standard and better Douglas Fir, Southern Pine, or HemFir, or StrandGuard by Trus Joist, Boise, ID www.tjm.com.
 - b. 2x6 38 mm by 140 mm And Wider: No. 2 or or MSR 1650f - 1.5e Douglas Fir, Southern Pine, HemFir, or StrandGuard by Trus Joist, Boise, ID www.trusjoist.com.
- B. Posts, Beams, And Timbers 5 Inches by 5 Inches 125 mm by 125 mm And Larger: No. 1 or better Douglas Fir or Southern Pine.
- C. Lumber Ledgers: No. 1 Douglas Fir, Larch, or Southern Pine.
- D. Blocking: Sound lumber without splits, warps, wane, loose knots, or knots larger than 1/2 inch 13 mm.
- E. Furring Strips: Utility or better.
- F. Sill Sealer: Closed-cell polyethylene foam, 1/4 inch 6 mm thick by width of plate.

PART 3 - EXECUTION

3.1 ERECTION

- A. General: Use preservative treated wood for wood members in contact with concrete or masonry, including wall, sill, and ledger plates, door and window subframes and bucks, etc.
- B. Interface With Other Work:
 - 1. Coordinate with other Sections for location of blocking required for installation of equipment and building specialties. Do not allow installation of gypsum board until required blocking is in place.
 - 2. Where manufactured items are to be installed in framing, provide rough openings of dimensions within tolerances required by manufacturers of such items. Confirm dimensions where not shown on Drawings.
- C. Floors:
 - 1. Place with crown side up.
 - 2. Provide accurately fitted header and trimmer joists of same size as regular joists around floor openings, unless detailed otherwise, and support by steel joist hangers.
 - 3. Double joists under partitions that parallel run of joists.
- D. Walls:
 - 1. Tolerances:
 - a. 1/4 inch 6 mm in 20 feet 6 meters, non-cumulative in length of wall.
 - b. 1/8 inch 3 mm in 10 feet 3 meters with 1/4 inch 6 mm maximum in height of wall.
 - c. Distances between parallel walls shall be 1/4 inch 6 mm maximum along length and height of wall.
 - 2. Openings: Single, bearing stud supporting header and one adjacent stud continuous between plates, unless shown otherwise.
 - 3. Corners And Partition Intersections: Triple studs.
 - 4. Top Plates In Bearing Partitions: Doubled or tripled and lapped. Stagger joints at least 48 inches 1 200 mm.
 - 5. Firestops:
 - a. Horizontal or vertical concealed spaces in walls, light coves, soffits, drop ceilings, and other features over 10 feet 3 000 mm in length or height, and at stairs, ceiling levels, floor levels, and other junctures of horizontal to vertical concealed spaces.
 - b. Within concealed spaces of exterior wall finishes and exterior architectural elements, such as trims, cornices or projections, at maximum intervals of 20 feet 6 000 mm, length or height.
 - 6. Sill Plates:
 - a. Shear Walls And Bearing Walls:
 - 1) Provide specified anchor 12 inches 300 mm maximum and 4 inches 100 mm minimum from each end of each plate.

- 2) Shear Walls: Fasten only with anchor bolts embedded in foundation wall.
- 3) Bearing Walls: Fasten with anchor bolts embedded in slab, or with screw anchors or expansion bolts in drilled holes.
- b. Non-Bearing Walls: Fasten with powder actuated fasteners.
- c. In addition to requirements of paragraphs 'a' and 'b' above, set sill plates of interior walls measuring less than 36 inches 900 mm in length in solid bed of specified construction adhesive, except where sill sealer is used.
- d. Install specified seal sealer under sill plates of exterior walls of main building and of acoustically insulated interior walls.
7. Posts And Columns: Unless shown otherwise, nail members of multiple member columns together with 16d at 6 inches 150 mm on center from each side.
8. Beams And Girders:
 - a. Built-Up Members:
 - 1) Stagger individual members of multiple span beams and girders so, over any one support, no more than half the members will have a joint. In all cases, however, joints shall occur over supports.
 - 2) Unless shown otherwise on Drawings, nail two-ply built-up members with 10d nails 12 inches 300 mm on center top and bottom, staggered on opposite sides. Nail three-ply built-up members with 16d nails at 12 inches 300 mm on center, top and bottom, staggered, on opposite sides. Set with crown edge up with full bearing at ends and intermediate supports.
 - b. Pre-Fabricated Members:
 - 1) Solid glu-lam, LVL or PSL members may be used in place of built-up 2x 38 mm framing members. Size shall be same as built-up member.
 - 2) Solid LVL or PSL members may be used in place of built-up LVL members. Size shall be same as sum of built-up members.
 - c. Wood shims are not acceptable under ends.
 - d. Do not notch framing members unless specifically shown in Drawing detail.
9. Nailing:
 - a. Stud to plate:

2 by 4 inch nominal	38 by 89 mm	End nail, two 16d OR toe nail, four 8d
2 by 6 inch nominal	38 by 140 mm	End nail, three 16d OR toe nail, four 8d
2 by 8 inch nominal	38 by 184 mm	End nail, four 16d OR toe nail, six 8d
2 by 10 inch nominal	38 by 235 mm	End nail, five 16d OR toe nail, six 8d
1-3/4 by 5-1/2 inch LVL	44 by 140 mm LVL	End nail, three 16d OR toe nail, four 8d
1-3/4 by 7-1/4 inch LVL	44 by 184 mm LVL	End nail, four 16d OR toe nail, six 8d
1-3/4 by 9-1/4 inch LVL	44 by 235 mm LVL	End nail, five 16d OR toe nail, six 8d
1-3/4 by 11-1/4 inch LVL	44 by 286 mm LVL	End nail, six 16d OR toe nail eight 8d
 - b. Top plates: Spiked together, 16d, 16 inches 400 mm on center.
 - c. Top plates: Laps, lap members 48 inches 1200 mm minimum and nail with 16d nails 4 inches 100 mm on center
 - d. Top plates: Intersections, three 16d.
 - e. Backing And Blocking: Three 8d, each end.
 - f. Corner studs and angles: 16d, 16 inches 400 mm on center.

E. Roof And Ceiling Framing:

1. Place with crown side up at 16 inches 400 mm on center unless noted otherwise.
2. Install structural blocking and bridging as necessary and as described in Contract Documents.
3. Special Requirements:
 - a. Roof And Ceiling Joists: Lap joists 4 inches 100 mm minimum and secure with code approved framing anchors.
 - b. Roof Rafters And Outlookers :
 - 1) Cut level at wall plate and provide at least 2-1/2 inches 64 mm bearing where applicable. Spike securely to plate with three 16d nails.
 - 2) Attach to trusses or other end supports with framing anchors described in Contract Documents.
 - 3) Provide for bracing at bearing partitions.
 - c. Folding Partition Headers And Header Backing:
 - 1) Provide for double or single track as required by Folding Partition Manufacturer.

- 2) Stagger joints in plywood.
- 3) Glue plywood layers together with continuous bead 2 inches 50 mm in from each edge and every 4 inches 100 mm on center between. In addition, Screw layers together with 1-1/4 inch 32 mm screws one inch 25 mm in from each edge and 12 inches 300 mm on center for length of header.
- 4) Secure headers and header backing to structure as described in Contract Documents.
4. Installation of Wood Trusses:
 - a. Handle, erect, and brace wood trusses in accordance with TPI / WTCA Booklet BCSI.
 - b. Do not install damaged or broken wood trusses. Replace wood trusses that are broken, damaged, or have had members cut out during course of construction.
 - c. Provide construction bracing for trusses in accordance with TPI DSB-89.
 - d. Provide continuous 2x4 horizontal web bracing as shown on truss shop drawings.
 - 1) Secure bracing to each truss with two 10d or 16d nails.
 - 2) Lap splice bracing by placing bracing members side by side on common web member. Butt splices are not acceptable.
 - e. Unless directed or shown otherwise, provide diagonal 2x4 bracing between trusses at each line of horizontal web bracing.
 - 1) This diagonal bracing shall be continuous and extend from junction of web and top chord of one truss to junction of web and bottom chord of different truss.
 - 2) Install bracing at approximately 45 degree angle. Bracing will extend over three trusses minimum or more as determined by height of trusses and 45 degree installation angle.
 - 3) Install brace on side of web opposite horizontal web bracing and nail to each web with two 10d or 16d nails.
 - 4) Install one brace every 20 feet as measured from top of brace to top of next brace.
5. Installation of Glue-Laminated Structural Units:
 - a. Install work in accordance with Fabricators instructions and Glue-Lam Erection Safety Practices.
 - b. Adequately support and brace work until tied into building structure to insure against collapse due to wind or other forces.
 - c. Maintain protection of beams until roofing has been installed.
6. Installation of Structural Composite Lumber:
 - a. Install temporary horizontal and cross bracing to hold members plumb and in safe condition until permanent bracing is installed.
 - b. Install permanent bracing and related components before application of loads to members.
7. Installation of Plywood Web Joists:
 - a. Handle, erect, and brace plywood web joists in accordance with Manufacturer's instructions.
 - b. Do not install damaged or broken plywood web joists.
 - c. Install temporary horizontal and cross bracing to hold members plumb and in safe condition until permanent bracing is installed.
 - d. Cut holes through webs at locations or of sizes shown on Drawings and as recommended by Manufacturer.
- F. Accessory / Equipment Mounting And Gypsum Board Back Blocking (nailers):
 1. Furnish and install blocking in wood framing required for hardware, specialties, equipment, accessories, and mechanical and electrical items, etc.
 2. Furnish and install back blocking in wood framing required for joints in gypsum wallboard.
 - a. Install back blocking between I-joist framing members with equivalent of Simpson Z2 clips attached with four 10d x 1-1/2 inch nails at each end, two into I-joist and two into blocking.
 - b. Attach back blocking at trusses, stick framing, or walls with two 10d nails in each end of each piece of blocking.
- G. Furring Strips
 1. On Wood or Steel: Nail or screw as required to secure firmly.
 2. On Concrete or Masonry:
 - a. Back up furring strips on exterior walls or walls in contact with earth with 15 lb felt strip.
 - b. Nail at 12 inches 300 mm on center maximum.

END OF SECTION

SECTION 06 1636

WOOD PANEL PRODUCT SHEATHING

PART 1 - GENERAL

1.1 SUMMARY

- A. Includes But Not Limited To:
 - 1. Furnish and install wood panel product sheathing required for walls, roofs, and floors as described in Contract Documents.

1.2 QUALITY ASSURANCE

- A. Pre-Installation Conference: Participate in pre-installation conference specified in Section 06 1100.

1.3 DELIVERY, STORAGE, AND HANDLING

- A. Protect sheathing and keep under cover in transit and at job site.
- B. Do not deliver material unduly long before it is required.
- C. Store sheathing on level racks and keep free of ground. Stack to insure proper ventilation and drainage.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Sheathing:
 - 1. Meet requirements of PS 1-95, PS 2-92, PRP-108 (APA), or PRP-133 (TECO). Except where plywood is specifically indicated on Drawings, oriented strand board (OSB) is acceptable.
 - 2. Every sheet of sheathing shall be stamped as follows:
 - a. Appropriate APA, TECO, or PFS grade stamp identifying thickness and span rating.
 - 3. Sheathing shall not exceed 18 percent moisture content when fabricated or more than 19 percent when installed in Project.
 - 4. Sheathing 3/4 inch 19 mm thick and thicker used for single-layer subflooring shall be tongue and groove.
 - 5. Sheathing used for same purpose shall be of same thickness. In all cases, thickness specified is minimum required regardless of span rating.
 - 6. Minimum span ratings for given thicknesses shall be as follows:

Thickness		Span Rating
3/8 inch	9.5 mm	24 / 0
15/32 inch actual	11.9 mm actual	32 / 16
1/2 inch nominal	12.5 mm nominal	32 / 16
19/32 inch actual	15.1 mm actual	40 / 20
5/8 inch nominal	15.9 mm nominal	40 / 20
23/32 inch actual	18.3 mm actual	48 / 24
3/4 inch nominal	19 mm nominal	48 / 24

- B. Nails:
 - 1. 3/8 inch 9.5 mm panel thickness: 8d common or box.
 - 2. 15/32 inch 11.9 mm and thicker panels: 10d common or galvanized box.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General:
 - 1. Top of nail heads shall be flush with sheathing surface.
 - 2. Use of edge clips to provide spacing between sheathing panels is acceptable.
 - 3. Place nails at least 3/8 inch 9.5 mm in from edge.
- B. Wall Sheathing:
 - 1. Spacing: Provide 1/8 inch 3 mm space between sheets at end and edge joints.
 - 2. Edge Bearing And Blocking:
 - a. Panel edges shall bear on framing members and butt along their center lines.
 - b. Back block panel edges, which do not bear on framing members, with 2 inch nominal 45 mm framing.
 - 3. Size:
 - a. 15/32 inch actual 12 mm minimum thickness.
 - b. Do not install any piece of wall sheathing with shortest dimension of less than 24 inches 600 mm.
- C. Roof Sheathing:
 - 1. Placing:
 - a. Lay face grain at right angles to supports. Provide blocking for support where framing turns at roof overhang.
 - b. Provide 1/8 inch 3 mm space between sheets at end and side joints.
 - c. Stagger panel end joints.
 - d. Sheathing shall be continuous of two spans minimum.
 - 2. Size:
 - a. 19/32 inch 15.1 mm actual minimum thickness.
 - b. Do not install any piece of roof sheathing with shortest dimension of less than 24 inches 600 mm.
- D. Floor Sheathing:
 - 1. Subflooring: Bottom Layer of Two
 - a. Apply bead of glue to structural supports. Lay face grain / strength axis across supports and with panel continuous over two supports minimum.
 - b. Allow expansion gap of at least 1/2 inch 12.5 mm at walls.
 - c. Size:
 - 1) 19/32 inch actual 15 mm minimum thickness.
 - 2) Do not install any piece of bottom layer floor sheathing with shortest dimension of less than 24 inches 600 mm.
 - 2. Subflooring: Top Layer of Two or Single Layer.
 - a. Stagger joints of second layer subflooring so they do not line up with joints of first layer subflooring.
 - b. Glue subflooring layers together along lines of structural supports.
 - c. Leave 1/32 inch 1 mm gap at side and end joints, except where tongue and groove subflooring is used.
 - d. Size:
 - 1) 19/32 inch actual 15 mm minimum thickness, except where specifically noted otherwise.
 - 2) Do not install any piece of single layer floor sheathing with shortest dimension of less than 24 inches 600 mm.

3.2 PROTECTION

- A. Protect roof sheathing from moisture until roofing is installed.

END OF SECTION

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POLYVINYL-CHLORIDE ROOFING / PVC

PART 1 - GENERAL

1.1 SUMMARY

- A. Includes But Not Limited to:
 - 1. Install roofing membrane with flashings and other components to comprise total roofing system as described in Contract Documents.

1.2 SUBMITTALS

- A. Product Data: Roofing Manufacturer's literature or cut sheet for each element of system.
- B. Shop Drawings:
 - 1. Prepared by Roofing Manufacturer or its representative. Include outline of roof and roof size, location and type of penetrations, perimeter and penetration details, special details, and bill of materials.
 - 2. Confirm that specified FM Class and UL Class assembly is appropriate for Project location.
 - 3. Include approved copy of Manufacturers Notice of Award.
- C. Quality Assurance / Control:
 - 1. Two copies of Roofing Manufacturer's published specification for Architect and maintain one at job-site.
 - 2. Roofing Manufacturer's certification of Installer.
 - 3. Submit evidence that roof system has been tested and approved or listed as follows:
 - a. FM Class 1-90.
 - b. UL Class A assembly.
- D. Closeout: Submit record shop drawings to Roofing Manufacturer, if requested. Record shop drawings shall be given shop drawing number by Roofing Manufacturer.

1.3 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Roofing system shall be applied by Applicator authorized by Roofing Manufacturer before bid.
 - 2. Membrane and flashing installation shall be performed by personnel trained and authorized by Roofing Manufacturer.
 - 3. Welding equipment shall be provided by or approved by Roofing Manufacturer. Mechanics intending to use equipment shall have successfully completed training course provided by Manufacturer's Technical Representative before welding.
- B. Regulatory Requirements:
 - 1. Metal details, fabrication practices, and installation methods shall conform to applicable requirements of following:
 - a. Factory Mutual Loss Prevention Data Sheet 1-49 (latest issue).
 - b. Sheet Metal and Air Conditioning Contractors National Association Inc, 5th edition.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products job site in original unopened containers or wrappings bearing all seals and approvals.

- B. Handle materials to prevent damage. Place materials on pallets and fully protect from moisture.
- C. Store membrane rolls lying down on pallets fully protected from weather with clean canvas tarpaulins.
- D. Cover insulation stored on job site to protect from moisture and UV rays. Factory wrap is not an acceptable cover material.
- E. Store insulation elevated off the ground or roof deck to protect from moisture.
- F. Do not store or use flammable adhesives vicinity of open flames, sparks, and excessive heat.
 - 1. Store adhesives at temperatures above 40 deg F 4 deg C.
 - 2. Store flammable materials in cool, dry area away from sparks and open flames. Follow precautions outlined on containers or supplied by material manufacturer/supplier.
- G. Remove from job site materials that are determined to be damaged by Architect or by Roofing Manufacturer and replace at no additional cost to Owner.
- H. Take precautions that storage and application of materials and equipment does not overload roof deck or building structure.

1.5 WARRANTY

- A. Provide Roofing Manufacturer's 20-year system warranty on form included at the end of this section.
- B. Provide Contractor's 5-year warranty included at the end of this section.

1.6 ROOFING HISTORY

- A. Complete "DFCM Roofing History Record" included at the end of this section.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. All products (including insulation, fasteners, fastening plates and edgings) must be **manufactured and supplied** by the roofing system manufacturer and covered by the warranty.
- B. Membrane: fiberglass reinforced PVC.
 - 1. Energy Star Rated
 - 2. Only sheets with stable or low migrating plasticizers will be acceptable.
 - 3. Manufactured with low-wicking scrim, near center of membrane with no less than 20 mils polymer above scrim.
 - 4. Meet or exceed ASTM D 4434 for linear dimension al change and for heat aging
 - 5. Meet or exceed ASTM D 5635 for dynamic impact resistance
 - 6. Meet or exceed ASTM D 2136 for low temperature flexibility.
 - 7. Surface Color: White.
 - 8. Membrane thickness: 0.072 inch, 2.0 mm thick by optimum width and length determined by job conditions.
- C. Approved Products:
 - 1. Carlisle-SynTec; Sure-Flex or
 - 2. Any UL listed Class-A PVC roof system, **approved by Architect**, meeting or exceeding the performance standard by the following manufacture's:
 - a. Gaf; 973-628-3000
 - b. Versico; 800-992-7663

- c. Sarnafill; 781 828 5400
- d. JohnsManville; 800-654-3103

2.2 ROOF DRAINS

- A. Copper retro fit drain insert
 - 1. Size to fit existing drain bowl
 - 2. Drain outlet seal: 2" wide band of expanding foam tape impregnated with asphalt
 - 3. Compatible with specified PVC roofing system
 - 4. Strainer dome: cast iron or aluminum
 - 5. Approved manufacturer: Marathon Roofing Products, 716-685-1108 or equal product approved by Architect.
- B. Overflow drains:
 - 1. Cast iron body with 2" high water dam, extension sleeve for insulation, under deck clamp, sump receiver and cast iron dome.

2.3 ACCESSORY PRODUCTS

- A. Insulation:
 - 1. All insulation must be covered under the appropriate DFCM manufacturer's warranty for low slope roofing.
 - 2. All insulation incorporated in the roofing system must be approved and documented as a UL rated assembly that meet code requirements of the building roofing system it is installed in.
 - 3. When applicable, insulation shall be installed in multiple layers. The first and second layer of insulation shall be mechanically fastened to the substrate in accordance with the manufacturer's published specifications.
 - 4. Insulation shall be a minimum of 3" thick Sure-Seal Polyiso HP-DWD as supplied by Carlisle.
 - 5. Insulation boards shall be Factory Mutual Class 1-90 approved.
 - 6. Insulation panels directly under adhered roofing membrane shall not exceed 48 inches by 48 inches 1 200 mm by 1 200 mm.
 - 7. Insulation shall have minimum 'R' value of 5 and thickness of one inch 25 mm.
 - 8. Insulation Adhesive:
 - a. Low rise foam adhesive.
 - b. Approved Products.
 - 1) Weathertite Adhesive by Millenium Adhesive Products Inc.
 - 2) Olybond 500 by Olympic Manufacturing Group (OMG).
 - 3) LR2001 by Sarnafil
- B. Membrane Adhesives, sealants and cleaners:
 - 1. All products shall be furnished by Membrane manufacture specifically formulated for the intended purpose,
 - 2. Bonding Adhesive: Sure-Flex PVC or Aqua Base 120 Bonding Adhesive or Membrane manufacturer's standard product.
 - 3. Edge Sealant: Membrane manufacturer's standard product.
 - 4. Sealer / Water Cut-Off Mastic: Membrane manufacturer's standard product.
 - 5. Pocket Sealant: One Part Pourable Sealer
 - 6. Cleaner: PVC Membrane Cleaner
- C. Walkway Pad: 1/4 inch 6 mm thick molded pad made of recycled material with welding tabs. Use left and right turns, end panels, T-panels, etc, to install continuous rooftop walkway network.
- D. PVC Coated Metal Flashing: 0.023 inch 0.56 mm thick G90 galvanized sheet metal laminated with 0.020 inch 0.51 mm thick membrane.
- E. Prefabricated expansion joint cover with foam tubing, galvanized metal nailing flanges, and membrane welding tabs.

- F. Felt mat used as asphalt barrier and smoothing / leveling layer.
- G. Prefabricated drain with seal and strainer.
- H. Prefabricated accessories pipe flashings and inside and outside corners made of PVC membrane.
- I. Reglet: Heavy aluminum flashing termination with stiffening ribs and sealant support shelf used at walls and tall curbs when counterflashings are unavailable. Reglet inside and outside corners are used to install continuous termination.
- J. Fastener: Self-tapping, corrosion resistant fastener used to attach insulation board or to fasten membrane at changes in slope.
- K. Fastener plate: 26 ga 0.478 mm, 3 inch 75 mm plate used with fasteners to clamp insulation boards in place.
- L. Prefabricated membrane vent pipe flashing made of membrane.

2.06 METAL EDGING AND MEMBRANE TERMINATIONS

- A. **Drip Edge:** a metal fascia/edge system with a 22 or 24 gauge continuous anchor cleat and .032 inch thick aluminum or 24 gauge steel fascia. Metal fascia color shall be as designated by the Owner's Representative.
- B. **Coated Metal:** 4'x 10' coated metal sheets made from 24 gauge galvanized steel with a minimum .035" thick non-reinforced white Sure-Flex laminate. Sure-Flex membrane can be welded directly to the Sure-Flex Coated Metal in accordance with the manufacturer's detail.
- C. **Termination Bar:** a 1 inch wide and .098 inch thick extruded aluminum bar pre-punched 6 inches on center; incorporates a sealant ledge to support Lap Sealant and provide increased stability for membrane terminations.

2.4 RELATED MATERIALS

- A. Miscellaneous Flashing Materials: As supplied by Roofing Manufacturer.
- B. Wood Nailers:
 - 1. Treat wood nailers for fire and rot resistance (wolmanized or osmose treated), No. 2 quality or better Douglas Fir. Creosote or asphaltic-treated wood is not acceptable.
 - 2. Wood nailers shall conform to Factory Mutual's Loss Prevention Data Sheet 1-49.
 - 3. Wood shall have a maximum moisture content of 19 percent by weight on dry weight basis.
- C. Plywood:
 - 1. When bonding directly to plywood, use 1/2 inch nominal 12 mm minimum CDX (C side out), smooth surfaced exterior grade plywood with exterior grade glue. Rough-surfaced plywood or high fastener heads will require use of felt behind flashing membrane.
 - 2. Plywood shall have moisture content of 19 percent maximum by weight on dry weight basis. Unless kiln-dried after treatment, wolmanized plywood is not acceptable due to moisture content.
- D. Vapor Retarders:
 - 1. As approved in writing by vapor retarder manufacturer and Roofing Manufacturer for intended use.
 - 2. Vapor Retarder Fastener / Adhesive:

- a. Fasteners: Meet code and/or insurance requirements. Fasteners shall be approved by Vapor Retarder Manufacturer, Factory Mutual, and Roofing Manufacturer.
 - b. Adhesives: Type III steep asphalt, conforming to ASTM D 312 for securing of asphalt base sheet vapor retarders to approved substrates as accepted by Roofing Manufacturer.
- E. Sealants and Pitch Pocket Fillers: As accepted by Roofing Manufacturer under specified warranty.
- F. Miscellaneous Fasteners And Anchors:
 - 1. Fasteners, anchors, nails, straps, bars, etc shall be of post-galvanized zinc or cadmium-plated steel, aluminum, or stainless steel. Mixing metal types and methods of contact shall be in such a manner as to avoid galvanic corrosion.
 - 2. Fasteners for attachment of metal to masonry shall be expansion type fasteners with stainless steel pins.
 - 3. Concrete fasteners and anchors shall have minimum embedment of 1-1/4 inch 32 mm and shall be approved for such use by Fastener Manufacturer.
 - 4. Wood fasteners and anchors shall have embedment of one inch 25 mm minimum and be approved for such use by Fastener Manufacturer.

PART 3 - EXECUTION

3.1 PREPARATION

- A. General:
 - 1. Verify that roof drain lines are functioning correctly before starting work of this Section. Report blockages in writing to Owner's representative, with copy to Roofing Manufacturer, for corrective action before beginning work of this Section.
 - 2. Remove existing roofing, base flashing, deteriorated wood blocking, and deteriorated metal flashings. Remove only that amount of existing roofing and flashing that can be made watertight with new materials during a one day period or onset of inclement weather.
 - 3. Check for roof sheathing that is water damaged, deteriorated or otherwise unsuitable for reuse. Coordinate removal and replacement with Architect or Owner.
 - 4. Stop work immediately if any unusual or concealed condition is discovered and immediately notify Owner in writing, with letter copy to Roofing Manufacturer.
- B. Inspect for defects such as excessive surface roughness, contamination, structural inadequacy, or any other condition that will adversely affect quality of work.
 - 1. Steel Deck: Bring rusted or deteriorated decking to attention of Owner's representative to determine method of treatment or replacement. Lightly sand rusted metal and treat with rust-inhibiting paint. Remove and replace sections that have rusted through. Deck attachment shall conform to FM Data Sheet I-28 and local code requirements.
 - 2. Poured Structural Concrete Deck: Surface shall be smooth, level, and free of moisture or frost. Remove sharp ridges, other projections, and accumulations of bitumen above surface to ensure smooth surface before roofing. Repair deteriorated decking.
- C. Install continuous treated wood nailers at perimeter of entire roof and around roof projections and penetrations as described on Project Drawings. Replace existing wood nailers shown to remain, if they contain rot or are otherwise damaged.
 - 1. Anchor nailers to resist minimum force of 300 pounds per lineal foot in any direction. Provide 1/2 inch 13 mm space between nailer lengths. Individual nailer lengths shall not be less than 36 inches 900 mm long. Nailer fastener spacing shall be at 12 inches 300 mm on center, or 16 inches 400 mm if necessary to match structural framing. Stagger fasteners 1/3 nailer width and install within 6 inches 150 mm of each end. Meet requirements current Factory Mutual Loss Prevention Data Sheet 1-49.
 - 2. Thickness shall match substrate or insulation height.
 - 3. Anchor existing woodwork that is to remain so as to resist minimum force of 300 pounds per lineal foot in any direction. Reuse only woodwork designated to be reused in detail drawings.

- D. Substrate shall be clean, smooth, dry, free of flaws, sharp edges, loose and foreign material, oil and grease. Roofing shall not start until defects have been corrected.

3.2 INSTALLATION

A. General:

1. Roof surfaces shall be free of water, ice and snow. Surfaces to receive new insulation, membrane, or flashings shall be dry. Should surface moisture occur, provide equipment necessary to dry surface before application.
2. Secure new and temporary construction, including equipment and accessories, so as to preclude wind blow-off and subsequent roof or equipment damage.
3. Install only as much roofing as can be made weathertight each day, including flashing and detail work. Clean seams and heat-weld before leaving jobsite.
4. Schedule and execute work without exposing interior building areas to effects of inclement weather. Protect existing building and its contents against all risks.
5. Install uninterrupted waterstops at end of each day's work and completely remove before proceeding with next day's work. Waterstops shall not emit dangerous or unsafe fumes and shall not remain in contact with finished roof as installation progresses. Replace contaminated membrane at no additional cost to Owner.
6. Avoid use of newly constructed roofing as walking surface or for equipment movement and storage. Where such access is required, provide necessary protection and barriers to segregate work area and to prevent damage to adjacent areas. Provide protection layer consisting of plywood over insulation board and roofing membrane for new and existing roof areas that receive rooftop traffic during construction.
7. Before and during application, remove dirt, debris, and dust from surfaces either by vacuuming, sweeping, blowing with compressed air, or similar methods.
8. Report rooftop contamination that is anticipated or that is occurring to Roofing Manufacturer to determine corrective steps to be taken.

B. Vapor Retarder / Air Barrier Installation:

1. Steel Deck: Lay vapor retarder directly over deck with side and end joints sealed in accordance with manufacturer's instructions. Vapor retarder may be loosely laid or adhered with adhesive supplied or recommended by same manufacturer.
2. Poured Structural Concrete Decks: Adhere base sheet vapor retarder to deck with full mopping of type III steep asphalt at rate of 25 lbs per 100 sq ft 11 kg per 9 sq meters minimum. Install vapor retarder in accordance with manufacturer's instructions. Conduct moisture and adhesion tests.

C. Insulation:

1. Where specified or required, install insulation as recovery layer over existing substrate and to obtain desired thermal value. Existing roof assembly shall be dry.
2. Neatly cut insulation cut to fit around penetrations and projections.
3. Install tapered insulation in accordance with insulation manufacturer's shop drawings.
4. Install tapered insulation around drains creating a drain sump.
5. Do not install more insulation board than can be covered with roofing membrane by end of day's work or onset of inclement weather.
6. Mechanical Attachment:
 - a. Fasten to deck with approved fasteners and plates in accordance with Insulation Manufacturer's, Factory Mutual's, and Roofing Manufacturer's recommendations for fastening rates and patterns. Quantity and locations of fasteners and plates shall also result in insulation boards resting evenly on roof deck/substrate so there are no large cavities or air spaces between boards and substrate.
 - b. Install fasteners in accordance with fastener manufacturer's recommendations. Fasteners are to have minimum penetration into structural deck as recommended by Fastener Manufacturer and Roofing Manufacturer.
7. Adhesive Attachment:
 - a. Set insulation into continuous coat or properly spaced ribbons of specified adhesive. Weigh down adhered insulation until adhesive cures.

- b. Insulation shall be fully bonded to substrate or vapor retarder.
 - c. Sarnabar fastened 12 inches 300 mm on center to structural concrete deck with approved fasteners is required. Install Sarnabar 48 inches 1 200 mm in from roof edge around entire perimeter of roof area, clamping assembly together. Sarnabar shall have coverstrip hot air welded over it.
- D. Recovery / Hard Board:
 - 1. Offset recovery/hard board joints 24 inches minimum from joints in underlying substrate or insulation.
 - 2. On metal or wood deck, secure recovery/hard board using low profile attachment plates and fasteners spaced as required by Membrane Manufacturer's warranty requirements.
 - 3. On concrete deck, use adhesive attachment similar to that used for insulation and as required by Membrane Manufacturer.
- E. Membrane:
 - 1. Inspect surface of insulation or substrate before installation of roof membrane. Substrate shall be clean, dry and smooth with no excessive surface roughness, contaminated surfaces or unsound surfaces such as broken, delaminated, or damaged insulation boards.
 - 2. Adhesive:
 - a. Apply adhesive using solvent-resistant 3/4 inch 19 mm nap paint rollers. Apply adhesive in smooth, even coating with no holidays, globs, puddles, or similar irregularities. Coat only area that can be completely covered in same day's operations with adhesive. Allow adhesive to dry completely prior to installing membrane.
 - b. When adhesive on substrate is dry, roof membrane is unrolled. Overlap adjacent sheets 3 inches 75 mm. Once in place, turn back one-half of sheet's length and coat underside adhesive at rate of 1/2 gal per 100 sq ft 2 liters per 9 sq meters. When adhesive has dried sufficiently to produce strings when touched with dry finger, roll coated membrane onto previously coated substrate being careful to avoid wrinkles. Do not allow adhesive on underside of membrane to dry completely. Amount of membrane that can be coated with adhesive before rolling into substrate will be determined by ambient temperature, humidity, and manpower. Press bonded sheet firmly in place with weighted foam-covered lawn roller by frequent rolling in two directions. Fold back remaining unbonded half of sheet and repeat procedure.
 - c. Apply no adhesive in seam areas.
 - 3. Hot-Air Welding Of Lap Areas:
 - a. General:
 - 1) Seams shall be hot air welded. Seam overlaps shall be 3 inches 75 mm wide minimum when automatic machine welding, and 4 inches 100 mm wide when hand welding.
 - 2) Membrane to be welded shall be clean and dry. No adhesive shall be in seam.
 - b. Hand Welding:
 - 1) Hand welded seams shall be completed in three stages. Allow hot-air welding equipment to warm up for one minute minimum before welding.
 - 2) Seam shall be tack-welded every 36 inches 900 mm to hold membrane in place.
 - 3) Weld back edge of seam with narrow but continuous weld to prevent loss of hot air during final welding.
 - 4) Insert nozzle into seam at 45-degree angle. Once proper welding temperature has been reached and membrane begins to 'flow', position hand roller perpendicular to nozzle and press lightly. For straight seams, use 1-1/2 inch 38 mm wide nozzle. Use 3/4 inch 19 mm wide nozzle for corners and compound connections.
 - c. Machine Welding: Follow Roofing Manufacturer's instructions and use recommended equipment.
 - d. Quality Control of Welded Seams: Check welded seams for continuity using rounded screwdriver. Make on-site evaluation of welded seams daily at locations directed by Owner's Representative or representative of Roofing Manufacturer. Take one inch 25 mm wide cross-section samples of welded seams at least three times a day. Patch each test cut at no additional cost to Owner.
- F. Decor Ribs:
 - 1. Mark lines on membrane to show location of ribs. Space ribs as directed by Architect.

2. Dowel ribs together and set in place along marked lines. Hand weld ribs to roof membrane beginning at lower end of rib and working upward to top end of rib.
- G. Walkway Pads:
1. Mark lines on membrane to determine location and direction(s) of walkway network. Membrane surface shall be clean.
 2. Apply one gallon one liter per 100 lineal ft 8 lineal meters of adhesive to back of walkway pad and allow to dry. Do not apply adhesive to back of welding tabs. Apply 1-1/2 gallons 1-1/2 liters per 100 lineal ft 8 lineal meters of adhesive to membrane at a width of 24 inches 600 mm.
 3. Turn walkway pads over and place in position into wet / tacky adhesive. Walk on walkway pads to press surfaces together. Heat-weld welding tabs to membrane.
- H. Flashings:
1. General:
 - a. Install flashings concurrently with roof membrane as job progresses. No temporary flashings shall be allowed without prior written approval of Owner's Representative and Roofing Manufacturer. Approval shall only be for specific locations on specific dates.
 - b. If water is allowed to enter under newly completed roofing, remove and replace affected area no additional cost to Owner.
 - c. Adhere flashings to compatible, dry, smooth, and solvent-resistant surfaces.
 2. Membrane Flashings:
 - a. Adhesive Application for Flashings:
 - 1) Apply adhesive using solvent-resistant 3/4 inch 19 mm nap paint rollers. Apply adhesive in smooth, even coatings with no holidays, globs, or similar irregularities. Coat only area that can be completely covered in same day's operations. Allow surface with adhesive coating to dry completely prior to installing flashing membrane.
 - 2) When surface is dry, cut flashing membrane to workable length and evenly coat underside with adhesive at rate of 1/2 gal per 100 sq ft 2 liters per 9 sq meters. When adhesive has dried sufficiently to produce strings when touched with a dry finger, roll coated membrane onto previously coated substrate being careful to avoid wrinkles. Do not allow adhesive on underside of membrane to completely dry. Overlap adjacent sheets 3 inches 75 mm. Flashings shall extend 4 inches 100 mm onto roofing membrane. Press bonded sheet firmly in place with hand roller.
 - 3) Apply no adhesive in seam areas that are to be welded.
 - b. Install Sarnastop fastened 12 inches 300 mm on center with acceptable fasteners into structural deck at the base of parapets, walls, and curbs. Also install Sarnastop at the base of tapered edge strips and at transitions, peaks, and valleys according to Roofing Manufacturer's details.
 - c. Extend flashings 8 inches 200 mm minimum above roofing level unless otherwise accepted in writing by Owner's representative and Roofing Manufacturer.
 - d. Adhere flashing membranes to solvent resistant substrates. Cut interior and exterior corners and miters and hot-air weld into place. No bitumen shall be in contact with membrane.
 - e. Mechanically fasten flashing membranes along top edge through tin discs or pre-drilled, galvanized metal strip washers spaced at of 12 inches 300 mm maximum on center.
 - f. Terminate flashings according to Roofing Manufacturer's recommended details.
 3. Metal Flashings:
 - a. Complete metal work in conjunction with roofing and flashings so that watertight condition exists daily.
 - b. Install metal to provide adequate resistance to bending and allow for normal thermal expansion and contraction.
 - c. Metal joints shall be watertight.
 - d. Securely fasten metal flashings into solid wood blocking. Fasteners shall penetrate wood nailer one inch 25 mm minimum.
 - e. Airtight and continuous metal hook strips are required behind metal fascias. Fasten hook strips 12 inches 300 mm on center into wood nailer or masonry wall.
 - f. Counterflashings shall overlap base flashings 4 inches 100 mm minimum.
 - g. Sarnaclad Metal Base Flashings: Space adjacent sheets of Sarnaclad 1/4 inch 6 mm apart. Fasten ends of Sarnaclad metal 6 inches 150 mm on center. Cover joint with 2 inch 50 mm wide aluminum tape. Hot-air weld 4 inch 100 mm wide strip of flashing membrane over joint.

- h. Sarnaclad Metal Edge Flashing: Fasten metal edge flashings with two rows of post-galvanized flat head annular ring nails, 4 inches 100 mm on center staggered. Space adjacent sheets of Sarnaclad metal 1/4 inch 6 mm apart. Cover joint with 2 inch 50 mm wide aluminum tape. Hot-air weld 4 inch 100 mm wide strip of flashing membrane over joint.
- I. Temporary Cut-Off:
 - 1. Construct temporary waterstops to provide 100 percent watertight seal. Make stagger of insulation joints even by installing partial panels of insulation. Carry new membrane into waterstop. Seal waterstop to deck or substrate so water will not travel under new or existing roofing. Seal edge of membrane in continuous heavy application of sealant as described above. When work resumes, cut-out contaminated membrane and dispose of off-site.
 - 2. If inclement weather occurs while temporary waterstop is in place, provide labor necessary to monitor situation to maintain watertight condition.
 - 3. If water is allowed to enter under newly completed roofing, remove affected area and replace at no additional cost to Owner.

3.3 FIELD QUALITY CONTROL

- A. Upon completion of installation and delivery to Roofing Manufacturer by Applicator of certification that installation has been performed in accordance with Contract Documents and Roofing Manufacturer's requirements, technical representative of Roofing Manufacturer shall inspect installed roofing system.

3.4 CLEANING

- A. Remove demolished material from site daily to legal dumping area legally authorized to receive such materials.
- B. Remove roofing waste material from site daily to legal dumping area authorized to receive such material.
- C. Site cleanup, including both interior and exterior building areas that have been affected by construction, shall be completed to Owner's satisfaction.
- D. Repair landscaped areas damaged by construction activities at no additional cost to Owner.

END OF SECTION



CONTRACTOR ROOFING WARRANTY

WHEREAS_____

Of
(Address)_____ (Phone)_____

Herein called the "Roofing Contractor", has performed roofing and associated ("work") on the following project:

Owner: State of Utah

Agency:_____

Name of Building:_____ DFCM Project Number_____

Address:_____

Area of Work:_____ Date of Acceptance:_____

Warranty Period: Five (5) years Date of Expiration:_____

AND WHEREAS Roofing Contractor has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period.

NOW THEREFORE Roofing Contractor hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work, and as are necessary to maintain said work in watertight condition. In addition to making the work watertight, the Roofing Contractor shall remove and/or repair blisters, ridges, flashings, splits and other irregularities which in the opinion of the Roofing Manufacturer's technical representative do not conform to acceptable roofing practices and conditions. These repairs shall be made prior to expiration of the five (5) year Warranty Period and to the satisfaction of the Roofing Manufacturer's technical representative.

This Warranty is made subject to the following terms and conditions:

1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by: a) lightning, windstorm; b) fire; c) failure of roofing system substrate including cracking settlement, excessive deflection, deterioration, and decomposition; d) faulty construction of parapet walls, copings, chimneys, skylights, vents, and equipment supports, not part of contractors work and e) activity on roofing by others including construction contractors, maintenance personnel, other persons, and animals whether authorized or unauthorized by Owner,

When work has been damages by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Contractor, and until cost and expense thereof has been paid by Owner or by another responsible party so designated.

- 2 The Roofing Contractor is responsible for damage to work covered by this Warranty, but is not liable for consequential damages to building or building contents, resulting from leaks or faults or defects of work.
- 3 During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Contractor, including cutting, patching and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void upon date of said alterations, but only to extent said alterations affect work covered by this Warranty. If Owner engages Roofing Contractor to perform said alterations, Warranty shall not become null and void, unless Roofing Contractor, prior to proceeding with said work, shall claim that said alterations would damage or deteriorate work, thereby reasonably justifying a limitation or termination of this warranty.
- 4 During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray cooled surface, flooded basin, or other use or service more severe than originally specified, this Warranty shall become null and void upon date of said change, but only to extent said change affects work covered by this Warranty.
- 5 The Owner shall promptly notify Roofing Contractor of observed, known or suspected leaks, defect or deterioration, and shall afford reasonable opportunity for Roofing Contractor to inspect work, and to examine evidence of such leaks, defects or deterioration.

- 6 This Warranty is recognized to be the only Warranty of Roofing Contractor on said work, and is in addition to the Roofing Warranty furnished by the Roofing Manufacturer, and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to him in cases of roofing failure. Specifically, this Warranty shall no operate to relieve Roofing. Contractor of responsibility for performance of original work in accordance with requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owners General Contractor.

IN WITNESS THEREOF, this instrument has been dully executed this _____ day of _____, 20_____.

Cosigned by General Contractor by:

(General Contractor) (Roofing Contractor)

(Business Address) (Business Address)

(Signature) (Signature)

(Title) (Title)



WARRANTY FOR SINGLE PLY ROOFING

WHERE AS, _____ (manufacture name), a corporation whose address is,

hereinafter called the Manufacturer, has manufactured and sold and caused to have applied, pursuant to the specifications and inspection, the necessary roofing materials to construct a PVC, TPO, EPDM or other single ply roof of approximately _____ square feet and associated roof flashing of approximately _____ linear feet on the building described below:

OWNER: STATE OF UTAH

DFCM PROJECT NO: _____

BUILDING NAME : _____

LOCATION: _____

DATE OF ACCEPTANCE OF ROOFING: _____

MANUFACTURE ADDRESS: _____

MANUFACTURER'S WARRANTY NO: _____

PHONE NUMBER FOR WARRANTY SERVICE: _____

ROOFING CONTRACTOR NAME: _____

ROOFING CONTRACTOR ADDRESS: _____

AND WHEREAS, by careful examination of said roof by the Manufacturer's representative, it has been determined that roofing materials have been applied in conformance with Manufacturer's specifications.

AND WHEREAS, Manufacturer represents and wishes to warranty, subject to the limits stated herein, that its roofing when so applied is effectively watertight for a period of twenty (20) years despite normal wear and tear by the elements, as well as guaranteeing it against defects in workmanship or materials.

NOW THEREFORE, said Manufacturer warranties to the said Owner that, as set forth below, during a period of twenty (20) years from the date of acceptance of said single-ply roofing described above, Manufacturer will at its own expense, make or cause to be made, any repairs that may be necessary, as a result of defects in workmanship or materials supplied by the Manufacturer which results in leaks or of normal wear and tear by the elements which results in leaks, and will maintain said roof in water tight condition free from all leaks arising from such causes. For purposes of this warranty, damage to the roof caused by any unusual natural phenomena shall not be deemed to be "normal wear and tear by the elements".

INCLUSIONS: This Warranty does cover, and Manufacturer shall be liable for the following:

- 1 Roofing membrane, membrane flashings, metal flashings, mechanical fastening system, anchors, adhesives, seaming materials, slip sheets, fabrics, insulations, under payments, and accessories furnished by the Manufacturer as incorporated into the roof membrane system.
- 2 Vapor barriers, insulations and / or materials furnished by the Manufacturer or approved to be incorporated into the roof membrane assembly and such damage as may result from failure of these materials.
- 3 Repair of splits, breaks, cracks, and seam failures in membrane system.
- 4 Leaks from failure in material or workmanship.

EXCLUSIONS: This Warranty does not cover, and Manufacturer shall not be liable for the following:

- 1 Metal work, including metal counter flashings, not a part of the roof membrane system and such damage as may result from application of these materials;
- 2 Any damage to the roof caused by structural defect in, or failure of, the building or defects in, or failure of, any structural roof deck, or other sheathing materials, used as the base over which the roof and roof insulation is applied;
- 3 Roof damage from special chemical conditions not disclosed to Manufacturer;
- 4 Any damage to the building or contents thereof, except replacement of damaged roof insulation and vapor barrier as noted under "INCLUSION" above;
- 5 Damage due to unauthorized alterations to roofing system.

- 6 Damage to the roof due to mechanical abrasion or abuse not caused by the Manufacturer.
- 7 Damage or failure directly caused by the re-use of existing material. (re-roof)
- 8 Reasonable care and maintenance will be the responsibility of the owner.

INSPECTION AND REPAIR: During the term of this Warranty, Manufacturer, its agents or employees, shall have free access to the roof during regular business hours. Upon verbal notice by Owner to Manufacturer within four days of the discovery of any leaks in the roofing system, or need of repair of roof, the Manufacturer shall have ten (10) days to inspect the roof. Following such inspection:

- 1 Manufacturer, at its own expense shall make such repairs as are required by this warranty.
- 2 In case owner or his agent has verbally notified Manufacturer that repairs are required and such repairs are not covered by the Warranty (including repairs required by owner's alteration, extension or addition to the roof) Manufacture, after having obtained Owner's consent thereto, in writing, shall make or cause to be made, such repairs at Owner's expense in accordance with specifications and procedures as established by Manufacturer and this warranty shall thereupon remain in effect for the un-expired portion of its original term. If Owner fails to so consent or if repairs are made by one other than the Manufacturer's authorized designee, this Warranty with respect to such area shall be automatically terminated.
- 3 In the event the (1) Owner notifies Manufacturer and has confirmed the need of repair of roof and (2) Manufacturer is unable to promptly inspect and repair same, and (3) an emergency condition exists which requires prompt repair in order to avoid substantial damage to owner, then owner may make such temporary repairs as may be essential and any such action shall not be a breach of the provision of this Warranty. Owner will bear emergency repair expenses.

INSPECTION SERVICE: Manufacturer agrees to re-inspect the completed roof not earlier than 18 nor later than 24 months after completion of the roofing, and if it is determined that there are defects in the roofing, then Manufacturer shall make, or cause to be made at its own expense, such repairs as are necessary to remedy said defects within the scope of its responsibility under the terms of this Warranty.

IN WITNESS WHEREOF, Manufacturer has caused this instrument to be signed and sealed by its duly authorized officer this day of _____

BY: _____

TITLE: _____

CORPORATION: _____

SEAL:

Project Manager Approval _____

Division of Facilities Construction and Management

Risk I.D. _____

DFCM Roofing History Record
Single Ply Roofing

State Building #

DFCM Project #

Facility Name:

Building Name and Address:

Roof Section Description:

Roofing Contractor Name and Address:

Sub-contractors:

Roof System manufacture:

Installation Date:

Warranty Information:

Manufacture:

Contractor:

Roof Area (sq./ft.)

Building Use:

Height above Ground:

Access to Roof Area: Ladder_____ Roof Hatch_____ Stairs_____

Roof System Information

New Construction:_____ Re-Roof:_____ Old Roof Removed: Yes_____ No_____

Comments:_____

Deck Type:

Slope:

Insulation:

Layer #1	Manufacture:	Thickness:	Attachment:
Layer #2	Manufacture:	Thickness:	Attachment:
Layer #3	Manufacture:	Thickness:	Attachment:

Taper Explain: _____

System Type: PVC_____ EPDM_____ HYPALON_____ CSPE_____ TPO_____

Other_____

Field Sheet Description: Manufacture_____ Brand Name_____ Mils_____

Attachment_____ Color_____ Reinforcement_____

Comments_____

Flashing Sheet: Manufacture_____ Brand Name_____ Mils_____

Attachment_____ Color_____ Reinforcement_____

Comments_____

Separation Sheet: Manufacture_____ Brand Name _____

Drainage:

Internal Roof Drains_____ Perimeter Gutter_____ Internal Gutter_____ Scuppers_____

Primary:

Manufacture:	Size:	Quantity:
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Overflow:

Manufacture:	Size:	Quantity:
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Details:

Walls:_____

Edge:_____

Expansion Joints:_____

Walkways:_____

Other:_____

Roof Top Equipment:

Mechanical: Unit Types:_____ Curb Types:_____ Quantity_____

Fans/Vents: Unit Types:_____ Curb Types:_____ Quantity_____

Other: Unit Types:_____ Curb Types:_____ Quantity_____

Pipe Penetrations:

1" Quantity:_____ Flashing Type:_____

1 ½ " Quantity:_____ Flashing Type:_____

2" Quantity:_____ Flashing Type:_____

3" Quantity:_____ Flashing Type:_____

4" Quantity:_____ Flashing Type:_____

5" Quantity:_____ Flashing Type:_____

6" Quantity:_____ Flashing Type:_____

Other Quantity:_____ Flashing Type:_____

Additional Comments or Drawings:_____

DFCM USE ONLY

State building # _____

Vendor ID _____

Installation year _____

Roof type _____

Manufacturer _____

Deck type _____

SECTION 07 6210

GALVANIZED STEEL FLASHING AND TRIM

PART 1 - GENERAL

1.1 SUMMARY

- A. Includes But Not Limited To:
 - 1. Furnish and install miscellaneous flashing, counterflashing, and hold-down clips as described in Contract Documents and not specified to be of other material.
- B. Products Supplied But Not Installed Under This Section:
 - 1. Gravel stops, copings, scuppers, and miscellaneous sheet metal specialties not specified to be of other materials.
- C. Related Sections:
 - 1. Section under 07 5000 heading: Installation of gravel stops, copings, scuppers, and miscellaneous roofing related flashing.

1.2 REFERENCES

- A. American Society For Testing And Materials:
 - 1. ASTM A 653-02a, 'Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.'
 - 2. ASTM A 792-03, 'Standard Specification for Steel Sheet, 55 Percent Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.'

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Sheet Metal:
 - 1. Galvanized iron or steel meeting requirements of ASTM A 653, G 90 or Galvalume steel meeting requirements of ASTM A 792 AZ50, 50 ksi.
 - a. 22 ga 0.792 mm for hold-down clips.
 - b. 24 ga 0.635 mm for all other.
 - 2. Finish:
 - a. Metal exposed to view shall have face coating of polyvinylidene Fluoride (PVF₂) Resin-base finish (Kynar 500 or Hylar 5000) containing 70 percent minimum PVF₂ in resin portion of formula. Thermo-cured two coat system consisting of corrosion inhibiting epoxy primer and top coat factory applied over properly pre-treated metal. Reverse side coating shall be thermo-cured system consisting of corrosion inhibiting epoxy primer applied over properly pre-treated metal.
 - b. Color as selected by Architect from Manufacturer's standard colors.
 - 3. Type Two Acceptable Manufacturers:
 - a. Copper Sales Inc, Minneapolis, MN www.unaclad.com.
 - b. Englert Inc, Perth Amboy, NJ www.englertinc.com.
 - c. Fabral, Lancaster, PA www.fabral.com.
 - d. Integris Metals, Minneapolis, MN www.integrismetals.com.
 - e. Metal Sales Manufacturing Corp, Sellersburg, IN www.mtlsales.com.

- f. Petersen Aluminum Corp, Elk Grove, IL www.pac-clad.com.
 - g. Equal as approved by Architect before installation. See Section 01 6200.
- B. Sealants: Rubber base type conforming to Fed Spec TC-S-00230.
- C. Fasteners:
 - 1. Of strength and type consistent with function.
 - 2. Nails: Hot-dipped galvanized.
 - 3. Screws, Bolts, And Accessory Fasteners: Galvanized or other acceptable corrosion resistant treatment.

2.2 FABRICATION

- A. Form accurately to details.
- B. Profiles, bends, and intersections shall be even and true to line.
- C. Fold exposed edges 1/2 inch 13 mm to provide stiffness.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install with small, watertight seams.
- B. Slope to provide positive drainage.
- C. Provide sufficient hold down clips to insure true alignment and security against wind.
- D. Provide 4 inch 100 mm minimum overlap.
- E. Allow sufficient tolerance for expansion and contraction.
- F. Insulate work to prevent electrolytic action.

3.2 CLEANING

- A. Leave metals clean and free of defects, stains, and damaged finish.

END OF SECTION

SECTION 07 6240

ALUMINUM FLASHING AND TRIM

PART 1 - GENERAL

1.1 SUMMARY

- A. Includes But Not Limited To:
 - 1. Furnish and install aluminum flashing, counterflashing, and hold-down clips as described in Contract Documents.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Sheet Aluminum:
 - 1. 3105-H25 alloy.
 - a. Flashing And Counterflashing: 0.040 inch 1.02 mm thick minimum.
 - b. Hold-Down Clips: 0.050 inch 1.29 mm thick minimum.
 - 2. Finish:
 - a. Unexposed: Mill finish.
 - b. Exposed To View:
 - 1) Face coating of polyvinylidene Fluoride (PVF₂) Resin-base finish (Kynar 500 or Hylar 5000) containing 70 percent minimum PVF₂ in resin portion of formula. Thermo-cured two coat system consisting of corrosion inhibiting epoxy primer and top coat factory applied over properly pre-treated metal.
 - 2) Color as selected by Architect from Manufacturer's standard colors.
 - 3. Type Two Acceptable Manufacturers:
 - a. Copper Sales Inc, Minneapolis, MN www.unaclad.com.
 - b. Englert Inc, Perth Amboy, NJ www.englertinc.com.
 - c. Fabral, Lancaster, PA www.fabral.com.
 - d. Integris Metals, Minneapolis, MN www.integrismetals.com.
 - e. Metal Sales Manufacturing Corp, Sellersburg, IN www.mtlsales.com.
 - f. Petersen Aluminum Corp, Elk Grove, IL www.pac-clad.com.
 - g. Equal as approved by Architect before installation. See Section 01 6200.
- B. Screws, Bolts, Nails, And Accessory Fasteners: Of strength and type consistent with function.

2.2 FABRICATION

- A. Form accurately to details.
- B. Profiles, bends, and intersections shall be even and true to line.
- C. Fold exposed edges 1/2 inch 13 mm to provide stiffness.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Slope to provide positive drainage.
- B. Provide sufficient hold down clips to insure true alignment and security against wind.
- C. Install with 4 inch 100 mm minimum overlap.
- D. Bed overlap joints in appropriate sealant specified in Section 07 9213.
- E. Form and lap step flashings.
- F. Allow sufficient tolerance for expansion and contraction.
- G. Insulate work to prevent electrolytic action.

3.2 CLEANING

- A. Leave metals clean and free of defects, stains, and damaged finish.

END OF SECTION

SECTION 07 6310

STEEP SLOPE ROOF FLASHING

PART 1 - GENERAL

1.1 SUMMARY

- A. Products Supplied But Not Installed Under This Section:
 - 1. Formed Valley Metal.
 - 2. Pipe flashing for vents and flues.
- B. Related Sections:
 - 1. Section 07 9213: Quality of sealants.

1.2 REFERENCES

- A. American Society For Testing And Materials:
 - 1. ASTM A 653-01, 'Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.'
 - 2. ASTM A 792-03, 'Standard Specification for Steel Sheet, 55 Percent Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.'

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Formed Valley Metal And Drip Edge:
 - 1. Metal:
 - a. Aluminum: 0.032 inch 0.81 mm thick minimum.
 - b. Steel: Minimum 24 ga 0.635 mm, hot-dipped galvanized to meet requirements of ASTM A 653, 1.25 oz/sq ft. or galvalume meeting requirements of ASTM A 792 AZ50, 50 ksi.
 - 2. Finishes:
 - a. Face coating polyvinylidene Fluoride (PVF₂) Resin-base finish (Kynar 500 or Hylar 5000) for coil coating components containing 70 percent minimum PVF₂ in resin portion of formula. Thermo-cured two coat system consisting of corrosion inhibiting epoxy primer and top coat factory applied over properly pre-treated metal.
 - b. Reverse side coating of steel flashings to be thermo-cured system consisting of corrosion inhibiting epoxy primer applied over properly pre-treated metal.
 - c. Color as selected by Architect from Manufacturer's standard colors.
 - 3. Acceptable Manufacturers:
 - a. Copper Sales Inc, Minneapolis, MN www.unaclad.com.
 - b. Englert Inc, Perth Amboy, NJ www.englertinc.com.
 - c. Fabral, Lancaster, PA www.fabral.com.
 - d. Integris Metals, Minneapolis, MN www.integrismetals.com.
 - e. Metal Sales Manufacturing Corp, Sellersburg, IN www.mtlsales.com.
 - f. Petersen Aluminum Corp, Elk Grove, IL www.pac-clad.com.
 - g. Equal as approved by Architect before installation. See Section 01 6200.
- B. Pipe Flashing For Plumbing Vent Lines:

1. 16 oz sheet copper or 4 lb per sq ft lead flashing.
2. Flashing base shall be at least 24 inches 600 mm square.

C. Roof Jacks For Flues: Factory-made galvanized steel.

2.2 FABRICATION

- A. Form accurately to details. Provide formed valley metal in 10 foot 3 meter lengths with one inch 25 mm "V" crimp and break in center to match roof slopes.
- B. Profiles, bends, and intersections shall be even and true to line.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Interface With Other Work: Coordinate with pipe installers for proper size of roof jacks and pipe flashing.
- B. Pipe Flashing For Plumbing Vent Lines.
 1. Copper: Fit snugly around pipes. Calk between copper flashing and pipe with specified sealant.
 2. Lead: Fit around pipes and turn down into pipe 1/2 inch 13 mm with turned edge hammered against pipe wall.

END OF SECTION

SECTION 07 9213

ELASTOMERIC JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Includes But Not Limited To:
 - 1. Furnish and install sealants not specified to be furnished and installed under other Sections.
 - 2. Quality of sealants to be used on Project not specified elsewhere, including submittal, material, and installation requirements.
- B. Related Sections:
 - 1. Furnishing and installing of sealants is specified in Sections specifying work to receive new sealants.

1.2 SUBMITTALS

- A. Product Data:
 - 1. Manufacturer's literature and installation recommendations for each Product.
 - 2. Schedule showing joints requiring sealants. Show also backing and primer to be used.
- B. Quality Assurance / Control: Certificate from Manufacturer indicating date of manufacture.

1.3 DELIVERY, STORAGE, AND HANDLING

- A. Handle to prevent inclusion of foreign matter, damage by water, or breakage.
- B. Deliver and keep in original containers until ready for use.
- C. Do not use damaged or deteriorated materials.
- D. Store in a cool place, but never under 40 deg F 4 deg C.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Sealants:
 - 1. Sealants provided shall meet Manufacturer's shelf-life requirements.
 - 2. Exterior Building Elements:
 - a. Joints and cracks around windows.
 - b. Aluminum entrance perimeters and thresholds.
 - c. Door frames.
 - d. Columns.
 - e. Louvers.
 - f. Wall penetrations.
 - g. Connections.
 - h. Parapet caps.

- i. Other joints necessary to seal off building from outside air and moisture.
- j. Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - 1) Dow Corning:
 - a) Primer: 1200.
 - b) Sealant: 791.
 - 2) General Electric:
 - a) Primer: SS4044.
 - b) Sealant: Silpruf SCS 2000.
 - 3) Tremco:
 - a) Primer:
 - (1) Metal: No. 20.
 - (2) Other: No. 23.
 - b) Sealant: Spectrum 1.
- 3. Exterior Sheet Metal And Miscellaneous:
 - a. Penetrations in soffits and fascias.
 - b. Roof vents and flues.
 - c. Flashings.
 - d. Gutters.
 - e. Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - 1) 791 or 790 by Dow Corning.
 - 2) Sikaflex 15LM by Sika Corp.
 - 3) Tremsil 600 by Tremco.
- 4. Exterior Concrete:
 - a. Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - 1) Joints between building foundations and exterior site concrete:
 - a) Dow Corning:
 - (1) Primer: 1200.
 - (2) Sealant: 790.
 - b) General Electric:
 - (1) Primer: SS4044.
 - (2) Sealant: Silpruf SCS 2000.
 - 2) Expansion joints in retaining walls:
 - a) Dow Corning:
 - (1) Primer: 1200.
 - (2) Sealant: 790.
 - b) General Electric:
 - (1) Primer: SS4044.
 - (2) Sealant: Silpruf SCS 2000.
 - 3) Expansion joints in Portland cement concrete driveways and parking lots:
 - a) Dow Corning: 888 (NS). 890 (SL) may be used on non-sloping areas.
- 5. Interior:
 - a. Inside jambs and heads of exterior door frames.
 - b. Inside perimeters of windows.
 - c. Miscellaneous gaps between substrates.
 - d. Category Four Approved Product. See Section 01 6200 for definitions of Categories.
 - 1) Tub, Tile, And Ceramic Silicone Sealant by Dow Corning.
 - 2) Acrylseal by General Electric.
 - 3) Tremsil 200 by Tremco.
- 6. Interior At Exposed Masonry Walls:
 - a. Both sides of interior door frames.
 - b. Category Four Approved Product. See Section 01 6200 for definitions of Categories.
 - 1) Tub, Tile, And Ceramic Silicone Sealant by Dow Corning.
 - 2) Acrylseal by General Electric.
 - 3) Tremsil 200 by Tremco.
- 7. Interior Joints Formed By:
 - a. Countertops and backsplash to wall.
 - b. Sinks and lavatories to countertops.
 - c. Termination joints in showers and fonts.
 - d. Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - 1) Tub, Tile, And Ceramic Silicone Sealant by Dow Corning.

- 2) Acrylseal by General Electric.
- 3) Tremsil 200 by Tremco.
8. Color: As selected by Architect from Manufacturer's standard colors.

- B. Backing: Flexible closed cell, non-gassing polyurethane or polyolefin rod or bond breaker tape as recommended by Sealant Manufacturer for joints being sealed.

2.2 MANUFACTURERS

- A. Contact Information:
 1. Dow Corning Corp, Midland, MI www.dowcorning.com.
 2. G E Silicone Products, Waterford, NY www.ge sealants.com .
 3. Sika Corporation, Lyndhurst, NJ www.sika.com .
 4. Tremco, Cleveland, OH www.tremcosealants.com .

PART 3 - EXECUTION

3.1 PREPARATION

- A. Surfaces shall be clean, dry, and free of dust, oil, grease, dew, or frost.
- B. Apply primer, if required.
- C. Joint Backing:
 1. Rod for open joints shall be at least 1-1/2 times width of open joint and of thickness to give solid backing. Backing shall fill up joint so depth of sealant bite is no more than 3/8 inch 10 mm deep.
 2. Apply bond-breaker tape in shallow joints as recommended by Sealant Manufacturer.

3.2 APPLICATION

- A. Apply sealant with hand-calking gun with nozzle of proper size to fit joints. Use sufficient pressure to insure full contact to both sides of joint to full depth of joint. Apply sealants in vertical joints from bottom to top.
- B. Tool joints immediately after application of sealant if required to achieve full bedding to substrate or to achieve smooth sealant surface. Tool joints in opposite direction from application direction, i.e., in vertical joints, from the top down. Do not 'wet tool' sealants.
- C. Depth of sealant bite shall be 1/4 inch 6 mm minimum and 1/2 inch 13 mm maximum, but never more than one half or less than one fourth joint width.
- D. Do not apply calking at temperatures below 40 deg F 4 deg C.
- E. Calk gaps between painted or coated substrates and unfinished or pre-finished substrates. Calk gaps larger than 3/16 inch 9 mm between painted or coated substrates.

3.3 CLEANING

- A. Clean adjacent materials, which have been soiled, immediately (before setting) as recommended by Manufacturer.

END OF SECTION

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SECTION 09 9001

COMMON PAINTING AND COATING REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Includes But Not Limited To:
 - 1. Common procedures and requirements for field-applied painting and coating.
- B. Related Sections:
 - 1. Section 07 9213: Quality of Elastomeric Joint Sealants.

1.2 REFERENCES

- A. Master Painters Institute:
 - 1. MPI(a), Mar 2001, 'Architectural Painting Specification Manual.'

1.3 DEFINITIONS

- A. Gloss Levels:
 - 1. Specified paint gloss level shall be defined as sheen rating of applied paint, in accordance with following terms and values, unless specified otherwise for a specific paint system.

Gloss Level '1'	Traditional matte finish - flat	0 to 5 units at 60 degrees to 10 units maximum at 85 degrees.
Gloss Level '2'	High side sheen flat - 'velvet-like' finish	10 units maximum at 60 degrees and 10 to 35 units at 85 degrees.
Gloss Level '3'	Traditional 'eggshell-like' finish	10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees.
Gloss Level '4'	'Satin-like' finish	20 to 35 units at 60 degrees and 35 units minimum at 85 degrees.
Gloss Level '5'	Traditional semi-gloss	35 to 70 units at 60 degrees.
Gloss Level '6'	Traditional gloss	70 to 85 units at 60 degrees.
Gloss Level "7"	High gloss	More than 85 units at 60 degrees.
- B. Properly Painted Surface: Surface that is uniform in appearance, color, and sheen and free of foreign material, lumps, skins, runs, sags, holidays, misses, strike-through, and insufficient coverage. Surface free of drips, spatters, spills, and overspray caused by Paint Applicator. Compliance will be determined when viewed without magnification at a distance of 5 feet minimum under normal lighting conditions and from normal viewing position (MPI(a), PDCA P1.92).
- C. Damage Caused By Others: Damage caused by individuals other than those under direct control of Painting Applicator (MPI(a), PDCA P1.92).
- D. Latent Damage: Damage or conditions beyond control of Painting Applicator caused by conditions not apparent at time of initial painting or coating work.

1.4 SUBMITTALS

- A. Product Data:
 - 1. Include following information for each painting system, arranged in same order as in Project Manual.
 - a. Manufacturer's cut sheet for each component of system indicating ingredients and percentages by weight and by volume, environmental restrictions for application, and film thicknesses and spread rates.
 - b. Copies of appropriate entries from MPI Approved Product List. Products from MPI Approved Product List is mandatory for Sections 09 9112, 09 9123 and 09 9124. If proposed manufacturer has products listed for these three Sections, but not for other Sections, Architect may approve products submitted by proposed manufacturer for other Sections.
 - c. Manufacturer's substrate preparation instructions and application instruction for each painting system used on Project.
 - d. Confirmation of colors selected and that each area to be painted or coated has color selected for it.
 - 2. Provide two copies of Product Data submission, one copy to be kept on Project site and second copy to be included in Operations And Maintenance Manual.
- B. Samples: Provide two 4 inch by 6 inch 100 by 150 mm minimum draw-down cards for each paint or coating color selected for this Project.

1.5 QUALITY ASSURANCE

- A. Regulatory Requirements: Paint and painting materials shall be free of lead and mercury, and have VOC levels acceptable to local jurisdiction.
- B. Field Samples:
 - 1. Before application of any paint system, meet on Project site with Architect, Owner's representative, and Manufacturer's representative. Architect may select one surface for application of each paint system specified. This process will include establishing acceptable substrate conditions required for Project before application of paints and coatings.
 - 2. Apply paint systems to surfaces indicated by Architect following procedures outlined in Contract Documents and Product Data submission specified above.
 - 3. After approval of samples, proceed with application of paint system throughout Project. Approved samples will serve as standard of acceptability.
- C. Pre-Installation Conferences:
 - 1. Participate in pre-installation conference specified in Section 09 2900 to review finish requirements of gypsum wallboard.
 - 2. Schedule painting pre-installation conference after delivery of paint but before or at same time as application of field samples.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver specified products in sealed, original containers with Manufacturer's original labels intact on each container. Deliver amount of materials necessary to meet Project requirements in single shipment. Notify Architect two working days before delivery of paint.
- B. Store materials in single place.
- C. Keep storage area clean and rectify any damage to area at completion of work of this Section. Maintain storage area at 55 deg F 13 deg C minimum.

1.7 PROJECT CONDITIONS

- A. Project Environmental Conditions:
 - 1. Perform painting operations at temperature and humidity conditions recommended by Manufacturer for each operation and for each product.
 - 2. Apply painting systems at lighting level of 540 Lux (50 foot candles) minimum on surfaces to be painted. Inspection of painting work shall take place under same lighting conditions as application. If painting and coating work is applied under temporary lighting, deficiencies discovered upon installation of permanent lighting will be considered latent damage as defined in MPI Manual, PDCA P1-92

1.8 SCHEDULING

- A. Coordinate with other trades for materials and systems that require painting before installation.
- B. Schedule painting and coating work to begin when work upon which painting and coating work is dependent has been completed. Schedule installation of pre-finished and non-painted items, which are to be installed on painted surfaces, after application of final finishes.

1.9 MAINTENANCE

- A. Extra Materials:
 - 1. Provide painting materials in Manufacturer's original containers and with original labels in each color used. Label each can with color name, mixture instructions, date, and anticipated shelf life.
 - 2. Provide one quart of each finish coat and one pint of each primer and of each undercoat in each color used.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Materials used for any painting system shall be from single manufacturer unless approved otherwise in writing by painting system manufacturer. Include such approvals in Product Data submittal.
- B. Linseed oil, shellac, turpentine, and other painting materials shall be pure, be compatible with other coating materials, bear identifying labels on containers, and be of highest quality of an approved manufacturer listed in MPI manuals. Tinting color shall be best grade of type recommended by Manufacturer of paint or stain used on Project.

PART 3 - EXECUTION

3.1 APPROVED APPLICATORS

- A. Applicator shall have experience in application of specified products for five years minimum and be acceptable to Architect and Paint Manufacturer.

3.2 EXAMINATION

- A. Instructions to applicator to begin painting and coating work will indicate that substrates to receive painting and coating materials have been previously inspected as part of work of other Sections and are complete and ready for application of painting and coating systems as specified in those Sections.
- B. Before beginning work of this Section, examine, and test surfaces to be painted or coated for adhesion of painting and coating systems. Report in writing to Architect of conditions that will adversely affect adhesion of painting and coating work. Do not apply painting and coating systems until party responsible for adverse condition has corrected adverse condition.
- C. Report defects in substrates that become apparent after application of primer or first finish coat to Architect in writing and do not proceed with further work on defective substrate until such defects are corrected by party responsible for defect.

3.3 PREPARATION

- A. Protection:
 - 1. Remove rags and waste used in painting operations from building each night. Take every precaution to avoid danger of fire.
 - 2. Protect other finish work and adjacent materials during painting. Do not splatter, drip, or paint surfaces not intended to be painted. These items will not be spelled out in detail but pay special attention to the following:
 - a. Do not paint finish copper, bronze, chromium plate, nickel, stainless steel, anodized aluminum, or monel metal except as explicitly specified.
 - b. Keep cones of ceiling speakers completely free of paint. In all cases where painting of metal speaker grilles is required, paint without grilles mounted to speakers and without grilles on ceiling.
- B. Surface Preparation:
 - 1. Prepare surfaces in accordance with MPI requirements and requirements of Manufacturer for each painting system specified, unless instructed differently in Contract Documents. Bring conflicts to attention of Architect in writing.
 - 2. Fill minor holes and cracks in wood surfaces to receive paint or stain.
 - 3. Surfaces to be painted shall be clean and free of loose dirt. Clean and dust surfaces before painting or finishing.
 - 4. Do no exterior painting while surface is damp, unless recommended by Manufacturer, nor during rainy or frosty weather. Interior surfaces shall be dry before painting. Moisture content of materials to be painted shall be within tolerances acceptable to Paint Manufacturer.
 - 5. Sand woodwork smooth in direction of grain leaving no sanding marks. Clean surfaces before proceeding with stain or first coat application.

3.4 APPLICATION

- A. Paint or finish complete all surfaces to be painted or coated as described in Contract Documents, including but not limited to following items.
 - 1. Finish casework and wood trims that are specified to be installed under Section 06 2001 and that are not called out to be factory- or shop-finished. Back prime wood elements to be installed against concrete or masonry or that may be subjected to moisture.
 - 2. Paint mechanical, electrical, and audio/visual items that require field painting as indicated in Contract Documents. These include but are not limited to:
 - a. Gas pipe from gas meter into building.
 - b. Metal protective structures for refrigerant lines.
 - c. Mechanical flues and pipes penetrating roof.
 - d. Electrical panel and disconnect enclosures.
 - 3. Metal reveals at ceiling access doors.

- 4. Paint inside of chases in occupied spaces flat black for 18 inches 450 mm or beyond sightline, whichever is greater.
- B. Apply sealant in gaps 3/16 inch and smaller between two substrates that are both to be painted or coated. Sealants in other gaps furnished and installed under Section 07 9213.
- C. On wood to receive a transparent finish, putty nail holes in wood after application of stain using natural colored type to match wood stain color. Bring putty flush with adjoining surfaces.
- D. In multiple coat paint work, tint each succeeding coat with slightly lighter color, but approximating shade of final coat, so it is possible to check application of specified number of coats. Tint final coat to required color.
- E. Spread materials smoothly and evenly. Apply coats to not less than wet and dry film thicknesses and at spreading rates for specified products as recommended by Manufacturer.
- F. Touch up suction spots after application of first finish coat.
- G. Paint shall be thoroughly dry and surfaces clean before applying succeeding coats.
- H. Use fine sandpaper between coats as necessary to produce even, smooth surfaces.
- I. Make edges of paint adjoining other materials or colors clean, sharp, and without overlapping.
- J. Finished work shall be a 'Properly Painted Surface' as defined in this Section.

3.5 ADJUSTMENT

- A. Correct deficiencies in workmanship as required to leave surfaces in conformance with 'Properly Painted Surface,' as defined in this Section. Correction of 'Latent Damage' and 'Damage Caused By Others,' as defined in this Section, is not included in work of this Section.

3.6 CLEANING

- A. As work proceeds and upon completion of work of any painting Section, remove paint spots from floors, walls, glass, or other surfaces and leave work clean, orderly, and in acceptable condition. Remove debris caused by work of paint Sections from premises.

3.7 PAINT COLOR

- A. Color: Selected by Architect

END OF SECTION

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SECTION 09 9112

EXTERIOR PAINTED FERROUS METAL

PART 1 - GENERAL

1.1 SUMMARY

- A. Includes But Not Limited To:
 - 1. Preparing and painting new exterior ungalvanized iron and steel surfaces as described in Contract Documents.
- B. Related Sections:
 - 1. Section 09 9001: Common Painting Requirements

1.2 SYSTEM DESCRIPTION

- A. Design Criteria: Systems specified are in addition to prime coats provided under other Sections of Project Manual.
- B. Use MPI(a) EXT 5.1M Waterborne Light Industrial Coating system .
- C. Finish Requirements: Use MPI Premium Grade finish requirements for work of this Section.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Gloss / Sheen Level Required: Gloss Level 5.
- B. Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - 1. Products listed in edition of MPI Approved Product List current at time of bidding and later are approved, providing they meet VOC requirements in force where Project is located.
 - 2. Primer Coat: MPI Product 107.
 - 3. Finish Coats: MPI Product 163.

PART 3 - EXECUTION

3.1 APPLICATION

- A. General: See appropriate paragraphs of Section 09 9001.
- B. New Surfaces: Clean metal to be painted of rust, mill scale, grease, oil, and welding spatters, burrs, flux, slag, and fume. If all traces of rust cannot be removed, apply rust blocker recommended by Paint Manufacturer before applying primer coat.

END OF SECTION

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SECTION 09 9113

EXTERIOR PAINTED GALVANIZED METAL

PART 1 - GENERAL

1.1 SUMMARY

- A. Includes But Not Limited To:
 - 1. Preparing and painting new exterior exposed galvanized metal surfaces as Described in Contract Documents.
- B. Related Sections:
 - 1. Section 09 9001: Common Painting Requirements.

1.2 SYSTEM DESCRIPTION

- A. Handrails And Exposed Miscellaneous Structural Steel: Use MPI(a) EXT 5.3D Pigmented Polyurethane Finish system.
- B. All Other: Use MPI(a) EXT 5.3H Latex Finish system
- C. Finish Requirements: MPI Premium Grade finish requirements.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Gloss / Sheen Level Required: Gloss Level 5.
- B. Category Four Approved Products. See Section 01 6200 for definitions of Categories.
 - 1. Products listed in edition of MPI Approved Product List current at time of bidding and later are approved, providing they meet VOC requirements in force where Project is located.
 - 2. Polyurethane:
 - a. Vinyl Wash Primer Coat: MPI Product 80.
 - b. Finish Coats:
 - 1) Epoxy MPI Product 101.
 - 2) Polyurethane MPI Product 72.
 - 3. Latex:
 - a. Waterborne Primer Coat: MPI Product 134.
 - b. Finish Coats: MPI Product 11.

PART 3 - EXECUTION

3.1 APPLICATION

- A. General: See appropriate paragraphs of Section 09 9001.
- B. Clean 'passivated' or 'stabilized' galvanized steel as specified in SSPC-SP1.

- C. After removal of 'passivated' or 'stabilized' coating or for surfaces without coating, clean surfaces to be painted with mineral spirits or product recommended by Paint Manufacturer. Change to clean rags or wiping cloths regularly to reduce possibility of re-contamination of surface.
- D. Apply prime coat.
- E. Apply finish coats.

END OF SECTION

SECTION 22 0501

COMMON PLUMBING REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Includes But Not Limited To:
 - 1. Common requirements and procedures for plumbing systems.
 - 2. Furnish and install sealants relating to installation of systems installed under this Division.
 - 3. Furnish and install Firestop Penetration Systems for plumbing systems penetrations as described in Contract Documents.
- B. Products Supplied But Not Installed Under This Section:
 - 1. Sleeves, inserts, supports, and equipment for plumbing systems installed under other Sections.
- C. Related Sections:
 - 1. Section 07 5419: Polyvinyl-Chloride Roofing / PVC

1.2 SUBMITTALS

- A. Product Data:
 - 1. Manufacturer's catalog data for each manufactured item.
 - a. Provide section in submittal for each type of item of equipment. Include Manufacturer's catalog data of each manufactured item and enough information to show compliance with Contract Document requirements.
- B. Closeout:
 - 1. Operation And Maintenance Manual Data:
 - a. At beginning of PLUMBING section of Operations And Maintenance Manual, provide master index showing items included.
 - b. Provide name, address, and phone number of Architect, Architect's Mechanical Engineer, General Contractor, and Plumbing subcontractor.
 - c. Include copies of warranties required in individual Sections of Division 22.

1.3 QUALITY ASSURANCE

- A. Requirements of Regulatory Agencies:
 - 1. Perform work in accordance with applicable provisions of Plumbing Codes applicable to Project. Provide materials and labor necessary to comply with rules, regulations, and ordinances.
 - 2. In case of differences between building codes, laws, local ordinances, utility company regulations, and Contract Documents, the most stringent shall govern. Notify Architect in writing of such differences before performing work affected by such differences.
- B. Identification:
 - 1. Materials shall bear Manufacturer's name and trade name. Equipment and materials of same general type shall be of same make throughout work to provide uniform appearance, operation, and maintenance.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.
- B. Storage:
 - 1. In addition to requirements specified in Division 01, stored material shall be readily accessible for inspection by Architect until installed.
 - 2. Store items subject to moisture damage in dry, heated spaces.

1.5 WARRANTY

- A. Guarantee plumbing systems to be free from noise in operation that may develop from failure to construct system in accordance with Contract Documents.
- B. Provide certificates of warranty made out in favor of Owner.

PART 2 - PRODUCTS

2.1 COMPONENTS

- A. Pipe And Pipe Fittings: Use domestic made pipe and pipe fittings on Project. Weld-O-Let and Screw-O-Let fittings are acceptable.
- B. Sleeves:
 - 1. In Framing: Standard weight galvanized iron pipe, Schedule 40 PVC, or 14 ga 2 mm galvanized sheet metal two sizes larger than bare pipe or insulation on insulated pipe.
 - 2. In Concrete And Masonry: Sleeves through outside walls, interior shear walls, and footings shall be schedule 80 black steel pipe with welded plate.

2.2 MANUFACTURED UNITS

- A. Fixtures: of same type shall be of same manufacturer.

PART 3 - EXECUTION.

3.1 EXAMINATION

- A. Site Inspection:
 - 1. Examine premises to understand conditions that may affect performance of work of this Division before submitting proposals for this work. Examine adjoining work on which plumbing work is dependent for efficiency and report work that requires correction.
 - 2. No subsequent allowance for time or money will be considered for any consequence related to failure to examine site conditions.
- B. Drawings:
 - 1. Plumbing Drawings show general arrangement of piping, equipment, etc. Follow as closely as actual building construction and work of other trades will permit.
 - 2. Consider Architectural and Structural Drawings part of this work insofar as these drawings furnish information relating to design and construction of building. These drawings take precedence over Plumbing Drawings.
 - 3. Because of small scale of Drawings, it is not possible to indicate all offsets, fittings, and accessories that may be required. Investigate structural and finish conditions affecting this work

and arrange work accordingly, providing such fittings, valves, and accessories required to meet conditions.

- C. Ensure that items to be furnished fit space available. Make necessary field measurements to ascertain space requirements including those for connections and furnish and install equipment of size and shape so final installation shall suit true intent and meaning of Contract Documents. If approval is received by Addendum or Change Order to use other than originally specified items, be responsible for specified capacities and for ensuring that items to be furnished will fit space available.

3.2 PREPARATION

- A. Check that slots and openings provided under other Divisions through floors, walls, ceilings, and roofs are properly located. Perform cutting and patching caused by neglecting to coordinate with Divisions providing slots and openings at no additional cost to Owner.
- B. Changes Due To Equipment Selection:
 - 1. Where equipment specified or otherwise approved requires different arrangement or connections from that shown in Contract Documents, submit drawings showing proposed installations.
 - 2. If proposed changes are approved, install equipment to operate properly and in harmony with intent of Contract Documents. Make incidental changes in piping, ductwork, supports, installation, wiring, heaters, panelboards, and as otherwise necessary.
 - 3. Provide additional motors, valves, controllers, fittings, and other equipment required for proper operation of systems resulting from selection of equipment.
 - 4. Be responsible for proper location of rough-in and connections provided under other Divisions.

3.3 INSTALLATION

- A. Interface With Other Work:
 - 1. Furnish exact location of electrical connections and complete information on motor controls to installer of electrical system.
 - 2. Furnish sleeves, inserts, supports, and equipment that are to be installed by others in sufficient time to be incorporated into construction as work proceeds. Locate these items and confirm that they are properly installed.
- B. Cut carefully to minimize necessity for repairs to previously installed work. Do not cut beams, columns, or trusses.
- C. Locating Equipment:
 - 1. Arrange pipes and equipment to permit ready access to valves, cocks, unions, traps, and to clear openings of doors and access panels.
 - 2. Adjust locations of pipes, equipment, and fixtures to accommodate work to interferences anticipated and encountered.
 - 3. Install plumbing work to permit removal of equipment and parts of equipment requiring periodic replacement or maintenance without damage to or interference with other parts of equipment or structure.
 - 4. Determine exact route and location of each pipe before fabrication.
 - a. Right-Of-Way:
 - 1) Lines that pitch shall have right-of-way over those that do not pitch. For example, plumbing drains shall normally have right-of-way.
 - 2) Lines whose elevations cannot be changed shall have right-of-way over lines whose elevations can be changed.
 - b. Offsets, Transitions, and Changes in Direction:
 - 1) Make offsets, transitions, and changes in direction in pipes as required to maintain proper head room and pitch of sloping lines whether or not indicated on Drawings.
 - 2) Furnish and install all traps, air vents, sanitary vents, and devices as required to effect these offsets, transitions, and changes in direction.

- D. Penetration Firestops: Install Penetration Firestop System appropriate for penetration at plumbing systems penetrations through walls, ceilings, roofs, and top plates of walls.
- E. Sealants:
 - 1. Seal openings through building exterior caused by penetrations of elements of plumbing systems.
 - 2. Furnish and install acoustical sealant to seal penetrations through acoustically insulated walls and ceilings.
- F. Furnish and install complete system of piping, valved as indicated or as necessary to completely control entire apparatus.
 - 1. Pipe drawings are diagrammatic and indicate general location and connections. Piping may have to be offset, lowered, or raised as required or directed at site. This does not relieve this Division from responsibility for proper installation of plumbing systems.
 - 2. Arrange piping to not interfere with removal of other equipment, ducts, or devices, or block access to doors, windows, or access openings.
 - a. Arrange so as to facilitate removal of tube bundles.
 - b. Provide accessible flanges or ground joint unions, as applicable for type of piping specified, at connections to equipment and on bypasses.
 - 1) Make connections of dissimilar metals with di-electric unions.
 - 2) Install valves and unions ahead of traps and strainers. Provide unions on both sides of traps.
 - c. Do not use reducing bushings, street elbows, bull head tees, close nipples, or running couplings.
 - d. Install piping systems so they may be easily drained
 - e. Install piping to insure noiseless circulation.
 - f. Place valves and specialties to permit easy operation and access. Valves shall be regulated, packed, and glands adjusted at completion of work before final acceptance.
 - 3. Do not install piping in shear walls.
 - 4. Cut piping accurately to measurements established at site. Remove burr and cutting slag from pipes.
 - 5. Work piping into place without springing or forcing. Make piping connections to pumps and other equipment without strain at piping connection. Remove bolts in flanged connections or disconnect piping to demonstrate that piping has been so connected, if requested.
 - 6. Make changes in direction with proper fittings.
- G. Provide spring clamp plates (escutcheons) where pipes run through walls, floors, or ceilings and are exposed in finished locations of building. Plates shall be chrome plated heavy brass of plain pattern and shall be set tight on pipe and to building surface.

3.4 REPAIR / RESTORATION

- A. Each Section of this Division shall bear expense of cutting, patching, repairing, and replacing of work of other Sections required because of its fault, error, tardiness, or because of damage done by it.
 - 1. Patch and repair walls, floors, ceilings, and roofs with materials of same quality and appearance as adjacent surfaces unless otherwise shown.
 - 2. Surface finishes shall exactly match existing finishes of same materials.

3.5 FIELD QUALITY CONTROL

- A. Site Tests:
 - 1. Perform tests on plumbing piping systems. Furnish devices required for testing purposes.
 - 2. Replace material or workmanship proven defective with sound material at no additional cost to Owner. Repeat tests on new material, if requested.

3.6 CLEANING

- A. Remove dirt, grease, and other foreign matter from each length of piping before installation.
 - 1. After each section of piping used for movement of water or steam is installed, flush with clean water, except where specified otherwise.
 - 2. Arrange temporary flushing connections for each section of piping and arrange for flushing total piping system.
 - 3. Provide temporary cross connections and water supply for flushing and drainage and remove after completion of work.
- B. Clean exposed piping, equipment, and fixtures. Remove stickers from fixtures and adjust flush valves.

3.7 PROTECTION

- A. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system. Cap or plug open ends of pipes and equipment to keep dirt and other foreign materials out of system. Do not use plugs of rags, wool, cotton waste, or similar materials.

END OF SECTION

SECTION 22 0529

HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Includes But Not Limited To:
 - 1. Common hanger and support requirements and procedures for plumbing systems.
- B. Related Sections:
 - 1. Slots and openings through floors, walls, ceilings, and roofs provided under other Divisions in their respective materials.

1.2 SUBMITTALS

- A. Product Data:
 - 1. Manufacturer's catalog data for each manufactured item.

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

- A. Hangers, Rods, And Inserts
 - 1. Galvanized and UL approved for service intended.
 - 2. Hangers and accessories shall be Anvil numbers specified or equals approved by Architect before installation.
 - a. Support horizontal piping from clevis hangers or on roller assemblies with channel supports, except where trapeze type hangers are explicitly shown on Drawings. Hangers shall have double nuts.
 - b. Support insulated pipes with clevis hanger equal to Anvil Fig 260 or roller assembly equal to Anvil Fig 171 with an insulation protection shield equal to Anvil Fig 167. Gauge and length of shield shall be according to Anvil design data.
 - c. Except uninsulated copper pipes, support uninsulated pipes from clevis hanger equal to Anvil Fig 260. Support uninsulated copper pipe from hanger equal to Anvil Fig CT-65 copper plated hangers and otherwise fully suitable for use with copper tubing.

- 3. Support rods for single pipe shall be in accordance with following table:

Rod Diameter	Pipe Size	Rod Diameter	Pipe Size
3/8 inch	2 inches and smaller	10 mm	50 mm and smaller
1/2 inch	2-1/2 to 3-1/2 inches	13 mm	63 mm to 88 mm
5/8 inch	4 to 5 inches	16 mm	100 mm to 125 mm
3/4 inch	6 inches	19 mm	150 mm
7/8 inch	8 to 12 inches	22 mm	200 mm to 300 mm

- 4. Support rods for multiple pipe supported on steel angle trapeze hangers shall be in accordance with following table:

Rods		Number of Pipes per Hanger for Each Pipe Size						
Number	Diameter	2 Inch	2.5 Inch	3 Inch	4 Inch	5 Inch	6 Inch	8 Inch
2	3/8 Inch	Two	0	0	0	0	0	0
2	1/2 Inch	Three	Three	Two	0	0	0	0
2	5/8 Inch	Six	Four	Three	Two	0	0	0
2	5/8 Inch	Nine	Seven	Five	Three	Two	Two	0

2	5/8 Inch	Twelve	Nine	Seven	Five	Three	Two	Two
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Rods		Number of Pipes per Hanger for Each Pipe Size						
Number	Diameter	50mm	63mm	75mm	100mm	125mm	150mm	200mm
2	10 mm	Two	0	0	0	0	0	0
2	13 mm	Three	Three	Two	0	0	0	0
2	16 mm	Six	Four	Three	Two	0	0	0
2	19 mm	Nine	Seven	Five	Three	Two	Two	0
2	22 mm	Twelve	Nine	Seven	Five	Three	Two	Two

- a. Size trapeze angles so bending stress is less than 10,000 psi 69 Mpa.
5. Riser Clamps For Vertical Piping: Equal to Anvil Figure 261.
6. Concrete Inserts:
 - a. Equal to Anvil Figure 282.
 - b. Suitable for special nuts size 3/8 inch through 7/8 inch with yoke to receive concrete reinforcing rods, and with malleable iron lugs for attaching to forms.
 - c. Continuous inserts shall be Equal to Unistrut P-3200 series.
7. Steel Deck Bracket: Equal to Unistrut P1000 with clamp nut, minimum 6 inch length.

2.2 MANUFACTURERS

- A. Contact Information:
 1. Anvil International, Portsmouth, NH www.anvilintl.com.
 2. Unistrut, Wayne, MI www.unistrut.com.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Piping:
 1. Properly support piping and make adequate provisions for expansion, contraction, slope, and anchorage.
 - a. Except for underground pipe, suspend piping from roof trusses or clamp to vertical walls using Unistrut and clamps. Do not hang pipe from other pipe, equipment, or ductwork. Laying of piping on any building element is not allowed.
 - b. Supports For Horizontal Piping:
 - 1) Support metal piping at 96 inches 2 400 mm on center maximum for pipe 1-1/4 inches 31 mm or larger and 72 inches 1 800 mm on center maximum for pipe 1-1/8 inch 28 mm or less.
 - 2) Support thermoplastic pipe at 48 inches 1 200 mm on center maximum.
 - 3) Provide support at each elbow. Install additional support as required.
 - c. Supports for Vertical Piping:
 - 1) Place riser clamps at each floor or ceiling level.
 - 2) Securely support clamps by structural members, which in turn are supported directly from building structure.
 - 3) Provide clamps as necessary to brace pipe to wall.
 - d. Insulate hangers for copper pipe from piping by means of at least two layers of Scotch 33 plastic tape.
 - e. Expansion of Thermoplastic Pipe:
 - 1) Provide for expansion in every 30 feet 9 meters of straight run.
 - 2) Provide 12 inch 300 mm offset below roof line in each vent line penetrating roof.

END OF SECTION

SECTION 22 0548

VIBRATION AND SEISMIC CONTROL FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Includes But Not Limited To:
 - 1. Quality of and requirements for anchorage and seismic restraint systems and vibration isolation systems for plumbing piping and equipment.
- B. Related Sections:
 - 1. Furnishing and installing of seismic restraint and vibration isolation systems is by installer of equipment requiring such systems. Manufacturers of equipment specified for seismic restraint shall provide product data needed for calculation of seismic restraint needs. This information shall include, but not be limited to, equipment dimensions, dimensioned anchor points, operating weight, and center of gravity dimension.

1.2 REFERENCES

- A. American Society For Testing And Materials:
 - 1. ASTM A 615-04b, 'Standard Specification for Deformed & Plain Billet-Steel Bars for Concrete Reinforcement.'
- B. Sheet Metal & Air Conditioning Contractors National Association / American National Standards Institute:
 - 1. SMACNA / ANSI 001-2000, 'Seismic Restraint Manual: Guidelines For Mechanical Systems.'

1.3 SUBMITTALS

- A. Product Data:
 - 1. Restraint system and anchorage method to be used for each piece of equipment.
 - 2. Seismic restraints and calculations for all flexible mounted equipment.
 - 3. Vibration isolators and flexible couplings.
 - 4. Clearly outlined procedures for installing and adjusting isolators, seismic bracing anchors, and snubbers.
- B. Shop Drawings:
 - 1. Show size, hanger length, and location of seismic restraints for piping and ductwork.
 - 2. Show details for each isolator and seismic brace with snubbers proposed for specified equipment.
 - 3. Show details for proposed structural steel frames and rails and for anchors to be used in conjunction with isolation of equipment.
 - 4. Show locations of piping and ductwork restraints on installation and fabrication floor plans (not bid set of documents of floor plans), noting size and type of restraint to be used.
 - 5. Show details of supports, hangers, anchorage, and bracing for isolated equipment as designed or proposed by professional engineer employed by Restraint Manufacturer and qualified with seismic experience in bracing for mechanical equipment. Shop drawings submitted for seismic bracing and anchors shall bear engineer's signed professional seal.
 - 6. Include anchor bolt calculations, signed and stamped by registered engineer, showing adequacy of bolt sizing and type.
 - a. Calculations shall include anchor embedment, minimum edge distance and minimum center distance.

- b. Design lateral forces shall be distributed in proportion to mass distribution of equipment.
- c. Furnish calculations for anchors on restraint devices, cable, isolators, and on rigidly mounted equipment.

1.4 QUALITY ASSURANCE

- A. Regulatory Requirements: System design and installation shall meet seismic requirements as defined in 2000 Edition of International Building Code and applicable state and local codes in accordance with minimum restraint capability of 1.0 g.
- B. Seismic Requirements: Mechanical equipment, piping, and ductwork shall be braced, snubbed, or supported to withstand seismic disturbances and remain operational.
- C. Vibration Isolation Requirements: Isolate equipment from structure by means of resilient vibration and noise isolators.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Isolation And Seismic Equipment:
 - 1. Piping: Restrain piping in accordance with Figures 4.11 to 4.19 in SMACNA Manual.
 - 2. Equipment with Fixed Anchor or Support:
 - a. Restraint designed according to Sections 1621 and 1622 of International Building Code.
 - b. Horizontal force factor for elements of structures:
 - 1) In addition, vertical force restraint requirement shall be computed at 1/2 value of horizontal forces.
 - 2) Restrain equipment not anchored directly to floors by cable system designed and furnished by Restraint Manufacturer.
- B. Seismic restraint equipment and resilient isolation devices shall be designed and furnished by single Manufacturer:
- C. Acceptable Manufacturers:
 - 1. Amber / Booth Company, Houston, TX www.amberbooth.com.
 - 2. Mason Industries Inc, Hauppauge, NY www.mason-ind.com.
 - 3. Vibration Mountings and Control Inc, Bloomington, NJ (201) 838-1780.
 - 4. Equal as approved by Architect before bidding. See Section 01 6200.

2.2 FINISHES

- A. Clean and paint steel components. Thoroughly clean structural steel bases of welding slag and prime with zinc-chromate or metal etching primer. Etch and paint hot dipped galvanized steel components.

END OF SECTION

SECTION 22 1313

FACILITY SANITARY SEWERS

PART 1 - GENERAL

1.1 SUMMARY

- A. Includes But Not Limited To:
 - 1. Furnish and install piping systems.
- B. Related Sections:
 - 1. Section 22 0501: Common Plumbing Requirements.

1.2 REFERENCES

- A. American Society For Testing And Materials:
 - 1. ASTM A 74-03b, 'Standard Specification for Cast Iron Soil Pipe and Fittings.'
 - 2. ASTM C 564-03a, 'Standard Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings.'
 - 3. ASTM D 2235-901, 'Standard Specification for Solvent Cement for ABS Plastic Pipe and Fittings.'
 - 4. ASTM D 2321-00, 'Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.'
 - 5. ASTM D 2564-02, 'Standard Specification for Solvent Cements for Poly (Vinyl Chloride)(PVC) Plastic Piping Systems.'
 - 6. ASTM D 3034-00, 'Standard Specification for Type PSM Poly Vinyl Chloride)(PVC) Sewer Pipe and Fittings.'
 - 7. ASTM F 628-01, 'Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe and Fittings with a Cellular Core.'
 - 8. ASTM F 656-02, 'Standard Specification for Primers for Use in Solvent Cement Joints of Poly (Vinyl Chloride)(PVC) Plastic Pipe and Fittings.'
 - 9. ASTM F 789-95a, 'Standard Specification for Type PSM Poly (Vinyl Chloride)(PVC) Plastic Gravity Flow Sewer Pipe and Fittings.'
 - 10. ASTM F 891-00, 'Standard Specification for Coextruded Poly (Vinyl Chloride)(PVC) Plastic Drain, Waste, and Vent Pipe Fittings with a Cellular Core.'

1.3 QUALITY ASSURANCE

- A. Pre-Installation Conference: Participate in pre-installation conference prior to installation.

PART 2 - PRODUCTS

2.1 COMPONENTS

- A. Minimum size of waste piping installed under floor slab on grade shall be 2 inches 50 mm.
- B. Piping And Fittings:
 - 1. Approved Types:
 - a. Service weight, single-hub or no-hub type cast iron soil pipe meeting requirements of ASTM A 74.
 - b. Drain lines: 3 inches.

2. Joint Material:
 - a. Single-Hub: Rubber gaskets meeting requirements of ASTM C 564.
 - b. No-Hub Pipe: Neoprene gaskets with stainless steel cinch bands.
- C. Fittings:
 1. Cast Iron Pipe: Hub and spigot, except fittings for no-hub pipe shall be no-hub, and meet requirements of ASTM A 74.
 - a. Joint Material: Rubber gaskets meeting requirements of ASTM C 564.
 - b. Galvanized Pipe: Screwed Durham tarred drainage type.
- D. Cleanouts:
 1. Furnish wall cleanouts with chrome wall cover and screw.
 2. Type Two Acceptable Products:
 - a. Exposed Drain Lines:
 - 1) Josam: 58910.
 - 2) J. R. Smith: 4510.
 - 3) Mifab: C1460.
 - 4) Wade: W8560B.
 - 5) Zurn: Z-1440.
 - b. General Purpose:
 - 1) Josam: 58900.
 - 2) J. R. Smith: 4400.
 - 3) Mifab: C1300-MF
 - 4) Wade: W8550E.
 - 5) Zurn: Z-1440.
 - c. Equal as approved by Architect before installation. See Section 01 6200.

2.2 MANUFACTURERS

- A. Contact Information:
 1. American Brass & Iron (AB&I), Oakland, CA www.abifoundry.com.
 2. Clamp-All Corp, Haverhill, MA www.clampall.com.
 3. Anaco-Husky, Corona, CA www.anaco-husky.com.
 4. Josam Co, Michigan City, IN www.josam.com.
 5. Jay R. Smith Manufacturing Co, Montgomery, AL www.jrsmith.com.
 6. MG Piping Products Co, Stanton, CA www.mgcoupling.com.
 7. Mifab Manufacturing Inc, Amherst, NY www.mifab.com.
 8. Wade Div Tyler Pipe, Tyler, TX www.wadedrains.com.
 9. Zurn Traps & Supplies, North Grosvenordale, CT www.zurn.com.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Metal Pipe And Fittings:
 1. Do not calk threaded work.
 2. Use torque wrench to obtain proper tension in cinch bands when using hubless cast iron pipe. Butt ends of pipe against centering flange of coupling.
- B. Install piping so cleanouts may be installed as follows:
 1. Where shown on Drawings and near bottom of each stack and riser.
 2. At every 135 degrees of accumulative change in direction for horizontal lines.
 3. Every 100 feet 30 meters of horizontal run.
- C. Furnish and install firestopping at penetrations of fire-rated structures as required under Sections 07 8400 and 22 0501.

3.2 FIELD QUALITY CONTROL

A. Site Tests:

1. Conduct tests for leaks and defective work. Notify Architect before testing.
2. Uncover pipe and correct leaks and defective work. Re-backfill and compact and re-test.

END OF SECTION

March 1, 2007

Bob Anderson
State of Utah DFCM
4130 State Office Bldg
Salt Lake City, UT 84114

Ref: Batch # 73200, Lab # DFC1194 - DFC1195
Received February 22, 2007
Test report
Utah State University - CPD Building
Sampled by Bob Anderson, 2/21/07

Dear Mr. Anderson:

Samples DFC1194 through DFC1195 have been analyzed by visual estimation based on EPA-600/M4-82-020 December 1982 optical microscopy test method. Appendix "A" contains statements which an accredited laboratory must make to meet the requirements of accrediting agencies. It also contains additional information about the method of analysis. Appendix "A" must be included as an essential part of this test report.

This report may be reproduced but all reproduction must be in full unless written approval is received from the laboratory for partial reproduction. The results of analysis are as follows:

Lab DFC1194, Field CPD-001 Noon - Asphalt roofing material - Roof sample

This sample contains four types of material: The first type is 25% synthetic fiber in black tar and rubber with white rocks on one side; the second type is 50% plant fiber in black tar felt layers; the third type is black tar layers; the fourth type is 95% glasswool in yellow resin. This sample is non-homogeneous. **Asbestos is none detected.**

The first type is 35% of the sample. The second type is 25% of the sample. The third type is 30% of the sample. The fourth type is 10% of the sample.

Lab DFC1195, Field CPD-002 12:15 - Asphalt roofing material - Flashing sample

This sample contains five types of material: The first type is 2% mineral wool in silver colored sealant; the second type is **50% chrysotile asbestos** and 5% plant fiber in black tar felt; the third type is cotton fabric in black tar; the fourth type is 50% plant fiber in black tar felt; the fifth type is black tar. This sample is non-homogeneous.

The first type is 5% of the sample. The second type is 55% of the sample. The third type is 5% of the sample. The fourth type is 20% of the sample. The fifth type is 15% of the sample.

Batch # 73200
Lab # DFC1194 - DFC1195
Page 2 of 2

In order to be sure reagents and tools used for analysis are not contaminated with asbestos, blanks are tested. Asbestos was none detected in the blanks tested with this bulk sample set.

Very truly yours,

Steve H. Dixon, President

Analyst: Steve H. Dixon_____ Date Analyzed: 3/1/07